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TRANSLATIONS ON USSR MILITARY AFFAIRS

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## RADIO EQUIPMENT OF AIRBORNE COMMAND POSTS

Moscow TEKHNIKA I VOORUZHENIYE in Russian No 2 1977 pp 46-47

[Article by V. Mikhaylov: "Radio Equipment of Airborne Command Posts"]

[Text] The U.S. Armed Forces control and communications system, in addition to fixed-location facilities, includes mobile command posts -- on airplanes, helicopters, and ships.

The airborne command posts (ACP) of the U.S. Armed Forces are divided into strategic and tactical. Strategic ACP perform functions of alternate and auxiliary control facilities and operate in a specified area according to a prior-prepared plan.

Tactical ACP are designed to provide troop control in mobile forms of combat (primarily ground forces) in a situation where communications with the principal command post have been lost or cannot be established. In some cases they perform functions of principal command posts.

Special communications relay aircraft are employed to increase the range of communications between ACP as well as between ACP and ground facilities.

Passenger liners or specially-designed aircraft are set up as ACPs. The following table contains the principal performance data on these aircraft.

	(1)	(2)	(3)	(4)		
	Характеристики	«Бонинг-707» (УС-137С)	Е-135	ЕС-130 («Танамо»)	В-47 (Петр.)	«Бонинг-747» (Е-4)
(5)	Крейсерская скорость, км/ч	950	950	550	1000	900
(6)	Потолок, м	10 000	12 000	10 000	14 000	13 000
(7)	Дальность полета, км	11 000	8000	6500	8000	11 000
(8)	Продолжительность по- лета, час	11	8	12	8	16
(9)	Грузоподъемность, т	24	40	16	10	75
(10)	Состав экипажа, человек	6	6	5	3	7

Key to table on preceding page: 1 -- performance data; 2 -- Boeing 707; 3 -- Tacamo; 4 -- communications relay; 5 -- cruising speed, km/h; 6 -- service ceiling, m; 7 -- range, km; 8 -- endurance, hours; 9 -- payload, tons; 10 -- crew

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The ACPs of the President, as Commander in Chief of the U.S. Armed Forces, are part of a national command system and provide for directing the country and the armed forces from the air in case of an enemy nuclear attack. It is believed that the President's ACPs should while in the air maintain direct communication with the White House, the State Department and the major armed forces command centers. A special network of ground tie-in communication facilities would be utilized by the President during travel abroad.

The airborne command posts of the national military command system are under the Joint Chiefs of Staff. These ACPs are for the purpose of direction and control of the U.S. Armed Forces by the President, Secretary of Defense and Chairman of the Joint Chiefs of Staff in case the military command center at the Pentagon and its back-up ground facilities are put out of action. One of them is in a continuous state of readiness to take to the air. While airborne the ACPs maintain communication with principal and alternate control facilities, the command centers of the armed forces branches, and theater command control facilities.

Airborne command posts of the U.S. Air Force Strategic Air Command (SAC) are a component part of the control system for missile and air combined units, units and facilities (figures 1, 2). They swing into action in case the main SAC ground command post is put out of commission. The SAC ACP group, together with communications relay aircraft, are sometimes called "post-nuclear-strike control system."

[Photograph not reproducible]

Figure 1. U.S. Air Force SAC Strategic Airborne Command Post Set Up On Board an EC-135A Aircraft.

[Photograph not reproducible]

Figure 2. Interior view of U.S. SAC ACP On Board EC-135A Aircraft.

These command posts are on around-the-clock airborne alert, following specified circuit routes. An ACP remains aloft eight hours. An ACP on airborne alert lands only after it receives confirmation that the next ACP has taken off. An ACP aircraft can be midair-refueled by a EC-135 tanker.

For airborne alert duty there are special operations teams, which contain operations planning officers, intelligence officers, radar operators, communications officer, cipher clerk, and other specialists. Scheduled training activities are conducted during alert duty, and communications with higher-echelon headquarters, the SAC ACP, command posts of the air forces and SAC divisions, as well as with all U.S. Air Force air and missile bases are checked.

The strategic ACPs of the President, the Joint Chiefs of Staff and the Strategic Air Command contain communications and control equipment, including two or three shortwave transceivers, three or four Vhf radios, equipment for multiple-channel radio communications in the decimeter band, satellite communications equipment, automated control, scrambling and encoding equipment, as well as special equipment for launching strategic missiles by radio command. In addition, the ACPs contain requisite radio navigation and radar gear.

Early models of the EC-135A airborne command post carried the AN/ARC-58 single-sideband aircraft transceiver with transmitter output of 1 kw. This

transceiver contains 28,000 fixed frequencies at a 1 kHz spacing across the 2-30 MHz band. Range of communications at selected frequencies is 3-5,000 km. The transceiver weighs 78 kg.

The latest-model EC-135C ACPs contain the new AN/ARC-104 single-sideband shortwave set with the same specifications but with 100 Hz channel spacing and remote control. Communications range is 5-6,000 km.

This equipment operates as a single-sideband radiotelephone and radiotelegraph with amplitude or frequency-shift keying. In view of the fact that this equipment is carried on board an ACP containing a fair amount of radio transmitting and receiving gear, special measures have been taken to ensure electromagnetic compatibility. For example, spurious transmitter emissions are suppressed by 120 db below the useful signal level at 50 Hz above and below the latter.

The AN/ARC-89 multiple-channel decimeter-band radio communications equipment includes four AN/ART-42 transmitters, four AN/ARR-71 receivers, four AN/ACC-3 12-channel multiplexing units, an SB-1366 communications channel switching unit, type AT-1076/A antennas, control, monitoring and power supply panels. The AN/ARC-89 package was developed specially for airborne command posts and communications relay aircraft. It can provide six simultaneous radiotelephone conversations between the ACP and the ground in various communications networks, in the U.S. Air Force 225-400 MHz band, or relay of two communications routings simultaneously.

The AN/ART-42 1 kw transmitter has 3,500 fixed frequencies and consists of a frequency synthesizer, modulator, frequency multiplier, power amplifier, and power supplies. The remote control system makes it possible to switch transmitter frequency from the operator's console, with the aid of a servo unit, to any of 20 preselected communications frequencies. Multi-channel communications are provided with the aid of an AN/ACP-3 multiplexing unit with transmitter frequency modulation. Transmitter tuning accuracy is not worse than  $\pm 2.5$  kHz. Performance specifications are maintained up to altitudes of 7.5-12 km. Attenuation of stray radiation is not worse than 90 db. The transmitter weighs 97.2 kg.

The AN/ARR-71 receiver is a superheterodyne with dual frequency conversion. The first i-f is 40 MHz, and the second is 5.125 MHz. The receiver synthesizer contains 23 quartz resonators and provides tuning in a band from 225 to 400 MHz to any of 3,500 communications frequencies with 50 kHz spacing. The receiver is tuned from a remote control panel. Both frequency-modulation and amplitude-modulation signals can be received. Receiver sensitivity is 3-5 microvolts, stray channel attenuation 70 db, and image-frequency signal attenuation 60 db. The receiver is solid-state, weighs 8.1 kg, and can operate at altitudes up to 21 km.

The AN/ACC-3 multiplexing unit is a substantial improvement over the ACC-1 and ACC-2, formerly utilized by ACPs: it is 60 percent smaller in



size and 72 percent lighter. A standard frequency band of 60-108 kHz (including a monitor signal at 104 kHz) is employed to form 12 voice channels (300-3,200 kHz). Carrier frequency oscillator frequency stability is  $10^{-7}$ . With additional modemes, digital data can be transmitted by voice channel at a rate of 2,400 bit/s. The AN/ACC-3 51-channel unit weighs 224 kg.

Two AN/ARC-159 radio sets are carried by embarked aircraft and by helicopters. It operates in the 224-400 MHz band, employing amplitude modulation in radiotelephone mode, and has 7,000 fixed communication frequencies. This unit consists of a receiver, transmitter, power amplifier and control panel. Transmitter power is 10 watts. It features remote-control transmitter frequency tuning. The design incorporates integrated circuits and modules. Its dimensions are 165x120x124 mm and weighs 3.6 kg.

The AN/ARC-144 unit, which is placed at the location designated for the AN/ARC-27 and AN/ARC-34, also operates in the decimeter band (224-400 MHz). It operates in the following modes: amplitude modulation, carrier telegraphy, automatic direction finding, automatic relay, and has 3,500 communication frequencies with 50 kHz spacing. It can operate with telephone scrambling equipment (CSO) and a teleprinter. Remote tuning and frequency selection (from 20 preselected frequencies) are performed from a control panel. Transmitter power is 10-30 watts. Time between failures is 2,000 hours. The unit weighs 15 kg.

The AN/ARC-154 unit is used for communications between the ACP and ground facilities; this unit is based on the AN/PRC-70 infantry shortwave-vhf field radio set. It is a telephone-type set with frequency and single-sideband modulation, and operates in the 2-76 MHz band with 100 Hz spacing. It contains two transmitters: one for shortwave and one for vhf. Transmitter power is 10 watts, and the unit weighs 51 kg.

ACPs also carry satellite communications equipment (via LES-6 and Tacsat satellites) -- AN/ARA-64, t o strategic, and AN/ARC-116 t o strategic and tactical airborne command posts.

New electronic equipment on board the E-4B ACP includes improved satellite communications units operating in the centimeter (7-8 gigahertz) and decimeter (225-400 MHz) bands. The former is used for operation in the strategic communications system (DSCS 2), and the latter for Air Force and Navy satellite communications systems; the ACP also contains an updated AN/ARC-89 multichannel radio communications unit operating in the 225-400 MHz band, consisting of six 1 kilowatt transmitters, seven receivers, and multiplexing equipment for 75 telephone and telegraph channels (on all communications routings), plus 10 antennas; a vlf transmitter operating in the 17-60 kHz band, with a transmitting power of 200 kilowatts, for transmitting combat control signals to submarines via the U.S. Navy Tacamo ACP system.

In addition, plans call for placing on board E-4B ACPs a large number of terminal, switching and scrambling equipment. In designing this equipment particular attention is devoted to a major problem: protection of airborne electronic equipment against the damage-producing elements of a nuclear burst, particularly a pulse of electromagnetic energy.

Attention is being devoted to automation of the ACP command and control system, employing computers. In particular, the U.S. Air Force has placed a contract for the development and testing of automated control equipment for the SAC ACP, to be a component part of a reliable strategic forces control system "following a nuclear attack," PACCS-ADA. This system includes a VIC general-purpose digital computer with variable system of commands, two magnetic drum memories, five CRT displays with keyboard control, a printer for obtaining copies from the CRT screens, and two magnetic tape recording units for rewriting a control program.

It is noted that the PACCS-ADA system fits into SAC ground control systems and is linked to a 7090 computer at SAC Headquarters. Therefore standard problems (software), coded message in data transmission links, CRT display format, and form of printer readout are the same for the ACPs and the ground control system.

Memory capacity of the VIC digital computer is 8,192 words, but this is considered insufficient, and therefore storage capacity is to be increased to 32,000 words. Computer displays employ 31 cm diameter cathode-ray tubes; they can display 64 different symbols; 10 digits, 26 capital letters, plus other symbols.

The printer employs a new type of printing on heat-sensitive paper with the aid of a heat-emitting glass-covered semiconductor matrix and with minimal excitation voltage. It is reported in the press that this method has made it possible to reduce the acoustic noise level, to reduce power requirements, and to lower the level of electrical interference. Printing speed is 300 characters per second onto a paper roll 24 cm in width.

The more sophisticated 215 computer is being developed for this system. It has a speed of 400,000 operations per second and a storage capacity of 1 million bytes. The 215 computer features integrated circuits and automatically searches out and localizes malfunctions. Anticipated time between failures is 8,500 hours.

A special network of ground communications facilities has been set up for communications between airborne command posts and ground control facilities and systems.

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#### METHODS OF TRAINING YOUNG PILOTS DESCRIBED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 6, Jun 77 signed to press  
29 Apr 77 pp 1-3

[Article by Col Gen Avn P. Kirsanov, Honored Pilot of the USSR: "The  
Combat Development of Young Pilots"]

[Text] The Communist Party and Soviet Government are constantly looking after the steady buildup of the Air Force's combat might. Our country gives airmen first-class aviation equipment embodying the latest advances of scientific-technical progress. Each year aviation units are replenished with highly educated flight personnel whose combat development is one of the key facets of our combat training missions.

Guided by the demands of the 25th party congress and the October 1976 Plenum of the CPSU Central Committee for raising the efficiency of production and the quality of work in all areas, commanders, political agencies, and party and Komsomol organizations in aviation units and subunits are working hard to improve the training and educational process so that new flight personnel will master the intricate aviation equipment and weapons quickly and thoroughly and attain high marks in combat and political training with minimum expenditure of manpower and materiel. Socialist competition in honor of the 60th anniversary of Great October has become a powerful lever in mobilizing airmen to struggle for high marks in combat training.

In the summer training period Soviet airmen are bolstering the combat readiness of their units and subunits and polishing their air, fire, and tactical training. Successful accomplishment of these difficult and important missions depends heavily on how well each individual works and how thoroughly he understands his role and place in the combat collective. Taking the baton from the older generations of airmen, the veterans whose names and deeds are recorded in the battle chronicle of the Air Force, the new pilots and navigators are continuing the combat traditions of the heroes of the front.

Fitting new men in is far from an easy process. It requires thoroughly planned organization of training and educational work, consideration of

all factors that reflect the concrete situation, constant study of the personal traits of the pilots, and correct evaluation of their strengths and capabilities.

Young aviators receive good engineering knowledge at school. But when they graduate from higher educational institutions they are not yet ready as aerial fighters. Their real development as fliers begins in the unit. Experienced commanders organize continued training for pilots and navigators in a precise methodological order that allows the development of solid flying skills in accordance with the missions being performed and the characteristics of each arm of aviation.

The experience of leading units shows persuasively that the required skills are learned most effectively where training has a purposeful, dynamic structure and the elements of flying and types of training are worked through with short time intervals. Sometimes new pilots arriving in a unit are retrained for aircraft of other modifications or types. This makes their training even more complicated and demands effective use of every minute of training time.

New airmen are usually trained by the instructors who are best prepared methodologically and in terms of flying, those who can tell, show, and teach. Results are best when one instructor teaches no more than two pilots. If a large number of new pilots and navigators arrive in the unit at one time it is useful to single out an advanced group for the most capable, without neglecting those for whom training comes more slowly, of course. This approach makes it possible to organize training more purposefully and effectively.

Most of the combat training aircraft are ordinarily concentrated in the squadrons that have new pilots. All the same there are sometimes not enough two-seat trainers. In such cases experienced commanders divide the young pilots into groups and plan them for different flying shifts. Moreover, flights are organized so that pilots do not have more than three flights per regular shift until they have become fully integrated into the combat rhythm of the unit. After this the commander may plan more flights, taking account of the individual traits of each man. In this way new fliers assimilate the program better and do not become overtired.

Experience shows that a large part of flying time in the first year goes for learning piloting technique. This is entirely proper, for gaps and omissions in piloting skill will surely show themselves during the more complex types of training, in particular during adverse weather and combat application.

From literally the first flight instructors teach new pilots to carefully analyze the records of the monitoring and recording equipment. Each flight is reviewed and the systematic character of mistakes and deviations and their causes are identified, which makes it possible to work out techniques and preventive steps to prevent and correct them in later flights.

A pilot who is mastering modern equipment needs deep, solid knowledge of its design and aerodynamic features and the operating constraints which must be observed when performing flight assignments. Needless to say, a knowledge of special circumstances in flight and the ability to identify the degree of danger by distinguishing features, reach an intelligent decision for the given situation, and act quickly and decisively are an important component of flight training.

Independent training and drills have a large part in this. They must be correctly organized. The thing is that cadets are accustomed to being led by the hand, to put it figuratively, from stage to stage by the teachers and flight instructors. In the unit a new officer is personally responsible for individual training. Not all of them are able to work on their own as they should. The commanders in the units teach new men how to do this. Systematic, precisely organized checks on assimilation of the required knowledge and performance of independent jobs help in this too.

The method of individual assignments to work on separate training sections of the program is now commonly used. Young aviators present reports on particular topics to their fellow servicemen. Encouragement for subordinates who are learning well is beneficial, but when assimilation of the program is coming harder one must be patient and strive to see that they understand the study material thoroughly and completely. As experience demonstrates, new pilots cannot be allowed to fly otherwise.

The ability to model the flight assignment is an important factor in attaining high levels of flying skill. During ground preparation the pilot works out and memorizes a prepared model of the flight or creates a new one and selects the optimal variation of actions for its stages and elements giving due consideration to the characteristics and conditions of its fulfillment. Only after this do they fly. It appears that young pilots still lack adequate skills in modeling. The commanders must teach them. An experienced aerial fighter is distinguished from a less experienced one above all by anticipation, the ability to keep something in reserve, and the ability to react quickly and correctly to changes in the situation. Every new pilot must consider this from the very start of his development.

Aviators acquire some skills from simulator units that reproduce many of the elements of real flying. Methodologically correct drills on simulators and in the cockpit of the aircraft are an important constituent of the training of new pilots. Maximum use of simulators makes it possible to reduce required training time. The merit of simulators is that the pilot can acquire skills in working with different systems and equipment of the aircraft in safety on the ground; he can learn to distribute and switch attention, recognize and assess situations, compare hypotheses on the causes of an event or change in the flight parameters, generalize incoming information mentally and reach intelligent decisions, and work out actions more deeply for each stage of flying. Modeling a situation that is close to real makes it possible to transfer skills from the simulator to the actual aircraft.

When training flight personnel using simulators experienced instructors take account of the psychophysiological characteristics of the pilot's activities, the effects of drills on the formation of skills, and the positive and negative facets of simulators. On the one hand they help a new pilot learn the skills of instrument flying, working with the fixtures of the cockpit, and performing various other actions; on the other hand, it is hard to learn to fly by the natural horizon using a simulator because the pilot sees on the screen only a narrow sector of space. This makes it difficult to develop the skills of visual observation and orientation.

Some of the flight elements reproduced on the simulator differ substantially from the natural forms. For example, during takeoff the lift-off of the nose wheel is determined by the attitude indicator, which is not the case with a plane. During landing the ground cannot be followed clearly enough, which makes it impossible to correctly distribute attention and practice directing one's glance. The nature and comparative qualities of movements of the controls on the simulator and in real flight also differ slightly, and there is no feeling of angular accelerations. Unfortunately, current simulators are as yet unable to model all parameters of real flight. With this in mind, instructors conduct drills purposefully to develop in the pilots the qualities and skills needed for flying.

Experience shows that ignoring these requirements can result in failure to improve piloting skills and actions in special situations; they may even be worsened, giving rise to additional difficulties in flight training: during actual flight some time must be spent breaking down habits learned on the simulator but now standing in the way. This is much harder than developing all the required skills together.

While teaching control actions commanders consider that there are, in addition to information linkages through the pilot's conscious mind, also unconscious, direct linkages between the sensory and motor regions. In part these are acquired and in part they are inborn. This compels the instructor to study the pilot's individual psychophysiological traits comprehensively so as to develop and improve them in a methodologically correct fashion. At the same time the pilots themselves learn to assess their own strengths and capabilities, capabilities which will ultimately determine their readiness to fly. Thus, the completeness and strength of the skills and habits depends largely on the individual capabilities of the trainees but also on the pedagogical and methodological skill of the commanders and instructors. Therefore, constant study of the personal characteristics of subordinates and active influence on their development and improvement is an essential condition for improving the skill of aerial fighters.

Our leading commanders study the questions of the pedagogy, psychology, and physiology of flying labor thoroughly. When training young aviators they demonstrate high principles and objectivity, remembering that rushing and unnecessary restraint are equally harmful in flight training. They are distinguished by high party loyalty, great competence, discipline,

high standards, initiative, and an attentive, individual approach to the pilots. Taken together these traits insure continued improvement in the quality and effectiveness of flight training, development of collective interest and concern with the new pilots, and their adaptation and fitting into the military collective.

In the complex and multifaceted process of training new officers the personal example of the commander, his firmness and high standards, self-control and good spirits play an important role. Remembering that words as well as actions can show approval and instill confidence, commanders create a healthy psychological climate in the collective. This is very important to insure flight safety and perform assigned missions successfully. And if the combat collective, in addition to firm regulation order, precise organization of the training process, and high standards by leaders, has smooth relations between commanders and subordinates and among the men themselves, missions will be accomplished on time, with high effectiveness, and without expending extra effort. Deriving satisfaction from the labor they have put in the airmen strive to perform their duties even better.

Squadron commanders Lt Col V. Zelenyy and majors V. Devin and Yu. Markelov, deputy squadron commander Maj O. Dyakin, flight commanders captains V. Oross, P. Korandin, Yu. Bocharnikov, A. Ostapenko, G. Dubinskiy and many other officers have had good results in promoting the combat development of new pilots. They have several common traits: persistence, high principles and refusal to compromise in carrying on organizational, educational, and methodological work.

Before the start of the training year careful preparations were made in the subunits where these officers serve to receive the new replacements. All flights commanders became instructors. Methods assemblies, teaching methods training periods, and exchanges of know-how in teaching different types of flying were held. In command and methods flights the instructors were checked for ability to correct mistakes well, make correct and timely decisions in complex situations, and analyze and evaluate a flight. They studied techniques of identifying the talents and capabilities of the new airmen, ways for them to study the features of the aircraft and perform flight assignments, and how to determine moral-psychological readiness to fly. The characteristics of flight control were carefully reviewed and considered.

Before the new pilots arrived in the units (during their leaves after graduation) the commanders and political workers studied their service and flying records, levels of flight training, and strength of flying skills acquired. When the new men arrived in the subunits the commanders became more closely familiar with their practical and moral qualities during private talks. After the ceremonial acceptance of the airmen into the subunits they began work with carefully planned days of theoretical training.

Before flights began comprehensive drills were held for the new pilots in the aircraft cockpit and on simulators until they had worked

out the required actions and skills. During training periods on the aircraft equipment with technical personnel special-purpose drills on engine work on the ground were organized. Special note cards showing the order of actions and mutual reports were developed.

During flights the new pilots were given optimal flying loads. This made it possible to complete the introductory program in a short time with good results and put the pilots on their own. After this they made check flights in two-seat trainers for about three flying shifts. Breaks of not more than 4-5 days in the flights were taken into account in this. All these things enabled the commanders to keep track of the development of flying skills.

As the experience of leading subunits shows, timely ground preparation and special drills in techniques of flight performance, distribution of attention, and correction of possible errors are needed before each new type of flying: instrument flight, group teamwork in flight, and combat application. Graphic aids and moving models should be used extensively in this.

In many subunits the material for flight reviews is prepared by the pilots themselves, with their flight commanders, and at the review they tell about the mistakes they made and analyze their own actions. The commander only helps in the final analysis of the causes of the deviations and establishes steps to correct and prevent them. During preliminary preparation for regular flights the commander briefly reviews errors made in earlier flights, then the new assignment is studied in detail. The commander of the aviation regiment and his deputies consistently monitor the training of each flight.

An important condition for correct organization of training for new pilots is thorough and principled monitoring by the deputy regimental commander in charge of flight training. This experienced pilot checks to see that the main principle is followed: a sequence of training that conforms exactly to the program, and that the laws of flying are observed.

Purposeful party political work is very helpful during the formative period of new airmen's development. Political workers and party and Komsomol activists give on-the-spot solutions to questions of domestic and material-technical support. A preconceived placement of party and Komsomol activists in the subunits helps create a psychological climate of friendship and mutual understanding. Many new pilots head party groups and Komsomol organizations and are elected to the aktiv of various public organizations. For example, in the units there are councils of new officers, aktivs to organize cultural and sports events, and political information groups.

New pilots are enlisted to give lectures, hold discussions with personnel, act as sponsors, make graphic agitation materials, and set up Lenin rooms.



This accustoms them to public work, helps mold lofty ideological-political and moral qualities, and promotes closeness among comrades. Periodic reports by pilots on the work they have done have a good educational effect when given at sessions of party and Komsomol bureaus. Fair comradely criticism and assistance have a mobilizing effect and improve the quality of training.

New pilots lieutenants V. Sesov, V. Taran, K. Totskiy, M. Zhabinskiy, A. Kochetkov, S. Matveyev, and others have attained high marks in mastering flying skills. They are setting an example of conscientious preparation for flying during work on the ground and outstanding performance of flight assignments in the air.

The Air Force offers many examples of precise organization and correct use of opportunities and conditions for adapting new men to the ranks. In the aviation units where training for flight personnel has been put on a scientific basis the new airmen advance rapidly through the program of combat improvement and receive the 3rd class rating before the end of the training year. Continuous, thoughtful work by commanders and party and Komsomol activists to direct socialist competition brings gratifying results: air and fire training improve and combat readiness rises steadily.

The new pilots face important challenges during the summer period. The favorable weather conditions must be used to the full to improve professional skills, master combat application of the plane (helicopter), increase tactical training, and create every opportunity for a confident switch to flights under complex meteorological conditions.

Highly effective combat training is a reliable guarantee that the new pilots will quickly take a worthy place in the ranks of the flying defenders of our native land.

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#### QUALITIES OF SKILLED COMBAT PILOT DESCRIBED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 6, Jun 77 signed to press  
29 Apr 77 pp 8-9

[Article by Col V. Yadov: "No Right To Be Wrong"]

[Text] The airmen of the squadron commanded by Maj I. Ivanov were to participate in flight-tactical exercises. At the suggestion of party activists the command invited two veterans of the Great Patriotic War, Hero of the Soviet Union Yu. Chibisov and I. Palyanitsa, winner of numerous combat decorations, to a meeting of flight personnel. They were asked to share their experiences at the front with the young fliers.

"It was during the fighting for the Sinyavinskiye Hills," Yuriy Vasil'yevich Chibisov related. "Winter. It was terrifically cold. Our infantry was heading into the attack. We were giving them air support. We bombed the enemy trenches and strongpoints, fired rocket projectiles, cannons, and machine guns at them. It seemed that every head was down.

"The first wave of attackers was already drawing near the enemy line of defense. Suddenly I saw one of our soldiers fall, then another and a third. Against the snowy background it was distinct and clear. I felt bitterly sad. This meant I had done poorly, if our men were dying. The war was at its peak and I still hadn't learned to fight right.

"After the flights, and we had to make several in a row in those days, even though I was tired, I would sit at my desk, draw diagrams of strikes, study the tactics of our ground attack planes and techniques of hitting particular targets using different kinds of weapons."

"When supporting attacking troops ground attack planes and bombers often had to operate in the immediate vicinity of the attackers. Sometimes it would be only a few dozen meters from the enemy trenches to the forward chains of our infantry. Only exceptional self-control, confidence in our accurate aim, and decisive actions guaranteed that we would hit the target and protect our own men," Ivan Petrovich Palyanitsa related. "The pilot could not make a mistake, he did not have the right to be wrong. Victory was too precious to us and the cost of every mistake might be too high.

The very painstaking calculations we had made on the ground and our sighting drills were an enormous help to us then. Even on days of the most desperate fighting our commanders and political workers did everything they could to see that pilots were continuously increasing their knowledge, benefiting from the rich experience of the front, and taking off for each successive assignment thoroughly prepared."

The men in the classroom listened attentively to the stories of these two aviation veterans about the combat feats of the front line pilots. Before their eyes rose pictures of intense aerial battles against enemy fighters, of bold, decisive attacks. But it was especially instructive that even after they had become experienced aerial fighters with many victories behind them they continued studying hard, learning the enemy's strong and weak points and his tactics. Conditions in wartime were not right for planned training periods. The main teacher was the fiery sky above the front and the harsh examiner was battle itself against a strong and treacherous enemy, where every mission had to be performed effectively and correctly.

The veterans' reminder that victory was achieved not only through exceptional steadfastness, endurance, and heroism by our men, who inflicted maximum damage on the enemy, often at the cost of their lives, but also through flight, fire, and tactical superiority over the enemy forced the young pilots to look at themselves from the outside, so to speak, to assess their own fighting qualities and professional and moral-psychological preparedness for actions in a complex situation. Indeed, what is the modern aerial fighter like? What criterion determines his combat readiness? In wartime the results of a pilot's combat missions were a reliable criterion. But what about in peacetime?

It appears that an aerial fighter's preparedness today is defined first of all by his rating: the higher the rating he holds, the more ready he is to perform a complex mission. But there are differences among the 1st class pilots. The best of the best stand out not only for their comprehensive professional preparedness but also their unquenchable thirst for new knowledge and skills, creative approach to assigned work, and highly developed sense of responsibility for their own personal training and the successes of the entire combat collective. They are always willing to pass on the know-how and knowledge they have accumulated to their comrades and to help them at any time it is necessary.

Our 1st class pilots and masters of combat application majors V. V'yushin, S. Leitchenko, and N. Kabanovskiy have an outstanding knowledge of the equipment they fly and its flight characteristics, as well as the weapons and navigation equipment. They use it skillfully. These pilots have demonstrated their great mastery at many exercises. They skillfully pass on their know-how and knowledge to their subordinates, making use of the entire arsenal of methodological and pedagogical procedures and the force of the party word. They understand perfectly the enormous responsibility they are shouldering. Together with political workers and party and Komsomol activists these leading officers tirelessly teach pilots a sense

of duty to the party and the people and responsibility for excellent performance of assigned missions and do everything they can to see that aerial fighters are deeply aware of their role and place in defending our socialist fatherland.

It is common knowledge that air, fire, and tactical training are checked most completely at exercises where the situation created maximally approximates that of real battle. We can see how current aerial fighters operate from the example of the airmen of the squadron commanded by Maj I. Ivanov. All the pilots of the subunit are highly rated. They understood clearly that the forthcoming exercises were an important test, a kind of summary of all the work done before then. At that time, after the frank talk with the front veterans Yu. Chibisov and I. Palyanitsa, the squadron began intensive preparations for the tactical flight exercises.

The commander devoted special attention to work on the procedures and techniques of striking ground targets of different compositions. Thus, one of the missions called for delivering a bomb strike at high speed with minimum time intervals between groups. Antiaircraft, antimissile, and anti-interceptor maneuvers had to be worked out here. Naturally, when seconds counted, the actions of the pilots had to be as precise as those of a jeweler for a mistake by one member of a group could lead to mistakes by others that would increase in scope. This meant that neither the lead plane nor the wingman could make a mistake, they had no right to be wrong. But harmony and unity of actions demanded a great deal of work and exceptional conscientiousness and responsibility by each airman.

At the initiative of communists in the squadron competition began among pilots based on missions and standards, in particular accuracy in reaching the target. At first the most likely assignments were modeled, optimal variations were selected, and they were figured by times and stages. It is characteristic that the calculation was not made from time of take-off but from time of reaching the target. Total flying time, which was what determined starting time, was composed of the time for flying from the target, time spent over it, maneuvers in the enemy air defense zone, flight to the target, takeoff, and assembly. Variations were run through carefully on the ground. And indeed, after this purposeful ground preparation the pilots attained extremely high precision in reaching the target by time and place during training flights.

It is also relevant, I think, to mention that the commander devoted much attention to moral-psychological preparation of the airmen for actions under complex conditions. He realized that flying in tight battle formations, and bombing or launching missiles, has a fairly strong effect on the pilot's psyche. The closeness of friendly forces to the target, which was mentioned by the front veterans, has an equal effect. Therefore, special talks were held in the squadron and flights and pilots who had performed such missions earlier shared their experiences. In addition there were drills in sighting and working with the weapons.

Thoroughly planned and well organized moral-psychological preparation had given the men confidence that they would accomplish their missions at the upcoming flight-tactical exercises.

Finally the day came. The squadron was assigned to strike a target deep within the enemy defense. It was immediately clear that this assignment differed greatly from those that the pilots had been working on. The time allocated for preparation was very short. This is exactly what distinguishes conditions at exercises from planned daily flying work and inspires personnel to give their full effort. And this is where preparatory work shows up and we see how ready the aviators are to perform missions in the dynamic situations typical of modern combat.

The complicated situation did not catch squadron personnel unprepared. The knowledge and skills acquired during preparations for the exercises and the ability to model and calculate variations of the flight mission helped the commander find the most advantageous conditions for performance of the mission quickly, make the necessary calculations, reach a decision and draw up his plan. Flight personnel in the squadron handled their mission outstandingly.

I would like to note that the business-like, creative atmosphere that has been created in Major Ivanov's squadron promotes their successes. The commander trusts his subordinates and does not constrain their initiative by too much supervision, correctly believing that without trust there can be no question of developing self-reliance in the aviators or determination in their actions. This would preclude creativity and improvement in their skills. Nonetheless, the subunit has strict daily checks on the pilot's preparedness for each assignment; comprehensive tests of the airmen's combat training are conducted regularly and evaluations given. If there are deviations the commander, his deputies, and party and Komsomol activists take effective, operational steps to eliminate the problem and immediately organize preventive actions to avoid further mistakes.

One may object, of course, that the person who does nothing makes no mistakes too. But mistakes come in all shapes and sizes. If a person notices some error on the ground he remains on the ground. But in the air any deviation leads to disruption of the flight regime, failure to perform the assignment, or an immediate danger to safety. And experience teaches us that every pilot error has its cause in ignorance and incomplete training or inattention and neglecting flying rules. In the air force, therefore, we see that the man who drills a great deal and works hard to improve his knowledge and skills while on the ground does not make mistakes. This is most important for new pilots beginning their flying careers to remember.

I will give a simple example. The flight commander had told pilot Lt A. Cherkasov several times that after turning off the runway he was too slow in retracting the flaps. Because the commander had remarked on it one would expect the subordinate to take this into account on later flights. Cherkasov resolved to do so: "I will retract them sooner," he said. But he did not think through the order of actions in the cockpit and practice them mentally.

After his landing from a check flight in a two-seat trainer, at the end of the landing run the lieutenant took hold of the undercarriage control cock instead of the flaps control because he was hurrying too much. The struts slowly began collapsing. Flight instructor Capt G. Savchenko reacted instantly by putting the undercarriage cock on extend in the rear cockpit. Thanks to the instructor's correct reaction the plane was not damaged. But this could have happened on a combat aircraft, and then it would have been an expensive mistake.

At the flight review the lieutenant argued that it had been an accident. That was hardly true. One important link in the chain of pilot actions was simply missing, retracting the flaps at the very same time as he had failed to do so earlier. The conclusion was inescapable: if the pilot had done everything he was supposed to have done and known everything he was supposed to have known and if his commanders had checked him properly before allowing him to fly the mistake would have been precluded.

Years of flight training experience testifies unambiguously that only a pilot who habitually and without the slightest shortcut or indulgence thinks through literally every movement of a forthcoming flight in detail, carefully practices skills in simulators and the aircraft cockpit, and uses every flight to improve his combat training will become a true aerial fighter who operates without error in every flight in any situation, has full mastery of the equipment entrusted to him, and skillfully hits air and ground targets. Such officers are usually able to evaluate the results of each exercise self-critically, take a principled approach to their own mistakes, and do everything they can to eliminate weaknesses quickly and firmly.

The real aerial fighter is distinguished by an ability to think creatively on the ground and, especially, in the air. His excellent professional skills free him of the need to worry about how to fly the plane under the particular conditions, which switch to throw and when, which button to push. All these things are so well practiced they seem to be automatic. His mind is focused on the correct tactical maneuver and what particular weapon to use in the concrete case to accomplish the mission most effectively.

And it is the ability to perform each flight assignment with maximum effectiveness that serves as the chief criterion of an aviator's readiness for combat and victory.

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## SAFETY FACTORS IN COMBAT FLIGHT TRAINING DISCUSSED

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[Article by Mar Avn I. Pstygo, Honored Pilot of the USSR: "The Formula for Flight Safety"]

[Text] Our country is moving toward the 60th anniversary of Great October. Soviet people are preparing to celebrate this day with new successes in building communism. They are working with inspiration to realize the decisions of the 25th CPSU Congress. Personnel of the USSR Armed Forces are also preparing to greet the anniversary in a worthy manner. This includes our airmen, who are steadily bolstering the combat readiness of their units and subunits.

The results of the past period of combat training demonstrate that the quality and effectiveness of ground training and performance of flight missions in the Air Force have improved. The working style of commanders, political workers, and staff and service officers is better now. The aid given to them by party and Komsomol organizations has become more tangible. They are energetically mobilizing and organizing flight and engineering-technical personnel, command post specialists, and the men of the support subunits for successful performance of their missions.

But we cannot, we do not have the right, to be contented with past achievement, to rest on our laurels. In combat training, above all in flight training, we still find various shortcomings. This surely cannot be tolerated. We must completely eliminate the slightest deviations from the principles of the documents that regulate flying work and structure the training and education of our personnel in complete conformity with the requirements of the present day and the future.

Numerous planned activities are carried out in aviation units to improve flight safety and they are effective. The articles published in AVIATSIYA I KOSMONAVTIKA under the heading "Components of Safety" are a definite help to commanders, staff officers, political workers, IAS [aeronautical engineering service] and command post specialists, men of support subunits, and the party and Komsomol organizations. If we summarize the content of

these articles it is not hard to observe that they give, in expanded form, a formula for flight safety.

The experience of the past, our current practices, and research by scientists all affirm that the decisive determinants of flight safety are the high moral-political and fighting characteristics of the airmen; solid knowledge and strict daily observance of flying rules; profound knowledge and correct operation of equipment entrusted; thorough and careful preparation of the men for performance of the assignment received and effective checks on their actual readiness for determined, skillful actions in a situation maximally approximating that of real combat; regularity of flights and degree of personnel training; intelligent control and management of flights; reliability of aviation equipment; comprehensive flight support. Effective party political work is a key component of the safety formula.

The flight safety formula has been revealed in the titles of the articles published under the heading "Components of Safety." To put it concisely, one may say that flight safety (BP) is achieved through well-organized party political work (PPR), moral-fighting qualities (MBK), flying rules (ZLS), knowledge of the equipment being used (ZET), training and checks on readiness (PKG), regularity of flights and drills (RPN), management and control of flights (RUP), reliability of aviation equipment (NAT), and comprehensive flight support (VOP).

In mathematics increasing or diminishing any member of the right part of an expression destroys the equality. In application to our discussion this axiom can be put as follows: a disturbance in any one of the components of flight safety inevitably leads to deviation, error, possible cause of an air accident, and sometimes worse.

A thought which runs consistently through all the articles published under the "Components of Safety" heading is that preventive measures are important and essential. This is absolutely true. This is the only way to see that an inadequately trained pilot (crew member of a multiseat plane, helicopter) is not allowed to take off on assignment or that members of the flight control group with weak knowledge and uncertain skills and other such specialists involved with flight organization, servicing, and support are not put to work. When preventive inspections are well organized no plane will take off unless all essential operations have been performed.

The reliability and effectiveness of preventive measures is assured by the strict regulation standards of commanders and chiefs and the great sense of responsibility felt by flight, engineering-technical, and all other personnel for outstanding performance of their official duties.

The aviation regiment commanded by Lt Col G. Kolodiy once faced an important mission. Personnel accomplished it in a short time. One of the main factors was the ability of the commander, his deputies, and the staff and services to determine correct preventive measures to guarantee flight safety. They were not planned in general; rather they were specific, applicable to particular exercises.



If missions to the testing range were planned, for example, most of the attention at training periods for pilots would be devoted to modeling flight assignments, questions of distributing attention when using complex sighting and navigation systems, and tactics in a complicated situation. Engineering-technical personnel and aviation specialists reinforced their memory of safety steps in mounting bombs, shells, and loading cannons. Appropriate theoretical issues were worked out with the flight control group and other men. During these special drills all the men involved in performance of the forthcoming flights improved their skills.

Lieutenant Colonel Kolodiy always demanded that his deputies and squadron leaders teach the men using advanced know-how and that they identify, systematize, and thoroughly analyze the slightest errors in actions by the men, especially the pilots, in order to avoid recurrence of the mistakes. Other leading aviation commanders do the same. Needless to say, this attitude toward the work deserves approval and every possible support. Here is why.

Overlooking mistakes, superficial analysis, and ignoring cause-effect relationships can create an illusion of safety in the commander or chief. This relaxes the commander and his subordinates, puts them off guard. The following example shows graphically what may come of this.

The flight of fighter planes made its takeoff. Because of mistakes by the pilot the wingman of the first pair did not turn on the afterburner and the officer decided to stop the takeoff. But the second pair was starting its takeoff run at this moment. They caught up with the plane that had gone off first. The fighter planes passed unacceptably close to one another and it was purely accidental that the takeoff ended without mishap.

They decided in the unit that this potential cause of an air accident had occurred owing to pilot error in handling the fixtures in the cockpit. This satisfied them. But this finding was not correct.

The pilot's incorrect actions were just one of the causes of this flagrant mistake, and far from the main one. Flights that day were being conducted in violation of the requirements of basic guideline documents. The time interval between takeoffs of pairs in a flight was less than half what it should have been. It turned out that this had happened before, but they simply did not pay attention to it. Moreover, the officer controlling the flights did not know what to do when one of the planes in a group had to abort its takeoff unexpectedly.

A superficial analysis of what happened did not lead to a correct conclusion. Therefore, conditions for a recurrence of the mistakes remained. In the future pilots would be allowed to take off at reduced time intervals and the flight control officers would not be ready to give them effective assistance if the situation became complicated.

Let us look at the case from two standpoints. The commander sanctioned group takeoffs at reduced time intervals. In making this decision he was, at first glance, concerned for growth in the skill of his subordinates. Unfortunately, however, the officer did not think of the negative consequences of his plan and did not anticipate what it could lead to. But he should have foreseen it; this is one of the determining traits of command maturity.

It is essential to observe strictly and unfailingly all requirements for identification, analysis, and collection and recording of mistakes, especially possible causes of air accidents. This work should be done conscientiously every day. Only then will it be possible to plan and carry out reliable preventive steps to eliminate and forestall shortcomings.

One of the main components of the safety formula is regularity of flights and drills (for a pilot, members of a control group, or other specialists). With respect to this very timely problem I would like to talk about the instructional skill of an aviation commander.

"The commander of a flight, squadron, or regiment is the best pilot" -- this was the immutable rule during the war. It works in our day too. The officer who heads a subunit or unit should also be the best instructor and teacher of subordinates. He should understand the forms and methods of training on the ground and in flight in a creative, purposeful way and use those which are most effective and up-to-date. The commander must be able to recognize mistakes, analyze them intelligently, and help eliminate them.

Special care must be taken to teach this art to officers who are new in their positions and do not have adequate experience yet. One of the main goals that senior comrades doing such work should always have before them is unifying views of the methodology of training and educational work with subordinates. There are reserves here for a further rise in the combat readiness of aviation units and subunits and a guarantee of greater flight safety.

We know that every instructor has his own characteristics, his own approach to solving every concrete problem and evaluating the actions of the trainee. Thus it is unacceptable when different instructors alternate training the same pilot. The results of this are usually poor. Life demands that we put a resolute stop to such practices, that we evaluate all violations of methodology on principle and hold offenders strictly accountable.

Drills on special apparatus are an important means of raising the level of training and improving the moral-psychological characteristics of flight personnel and members of flight control groups. Multipurpose and piloting drills make it possible to reproduce a situation close to that which is encountered in the air or during management and control of crews. But all this equipment justifies itself only when there is a tireless search for better ways to use it.

Most of the leaders of aviation units and subunits understand their job that way. But we cannot yet say that the results of training periods on piloting and multipurpose drill apparatus are always as good as they should be. One sometimes runs into cases of misunderstanding of the role and place of this equipment in the overall training system and underestimation of the effect of drills on growth in professional training and improving the moral-psychological conditioning of the airmen. I think this is why we still observe cases of deviations in prelanding planning under complex weather conditions after passing the DPRM [long-range radio homing beacon]. Simulators offer a possibility of reducing the possibility of errors in this flight stage to a minimum or completely eliminating them.

Further improvement in instructional skills also depends on better use of simulation equipment in training periods. That is why it is important to create a situation as close as possible to the conditions of real flight and make input problems relevant to the missions that instructors will have to accomplish in the near future, on the next flight.

Now for a few words about using training planes and combat trainers to instill in personnel solid skills and high psychophysiological stability. Experience shows, for example, that flights under the hood are exceptionally important. Therefore, they should be held regularly, not now and then; this is especially true in periods of good weather.

I would like to emphasize that in any situation -- in the classroom, at simulation drills, in the air, and at the airfield -- the command and instructor must use all forms and methods of training to see that flight personnel develop the broadest possible scope of attention. After they have good powers of attention they can be taught to distribute attention correctly and to switch attention, striving for the fastest possible reaction to the situation and immediate, but planned actions to accomplish the assigned mission.

The problem of professional exactitude is also very timely for flight personnel and all aviation specialists. After completing a flight, for example, the controls should be set back to the initial position. After all, the one who gets into the cockpit after you will expect the equipment there to be in good order. Subordinates must be taught this kind of exactitude all the time.

We have touched on just a few factors which have significant effects on the quality of flying work. Other points of the flight safety formula have been explained in earlier articles. I believe that the units will adopt everything that is necessary and useful to them.

In conclusion let me observe the following. Flying is strictly regulated by definite rules. They are reflected in control documents and training literature. There is hardly a commander, pilot, navigator, or other specialist who does not study them. Our aviators have the most up-to-date equipment and weapons. We have excellent physical facilities and

equipment for training. All necessary conditions for good training are present. In short, we have objective opportunities to improve combat skill and further our successes in combat and political training.

Then why do we still see possible causes of air accidents? When one asks that question, then compares and analyzes cases, there is usually just one conclusion: flagrant mistakes are always preceded by some violation of the requirements of the fundamental guidelines and by the poor discipline and work performance of certain airmen. This usually occurs where educational work has slackened and leader-officers do not work their hardest in their official duties.

I happened once to talk to a certain regimental commander. To my surprise, the officer was unable to give specific answers to some questions about the level and quality of training for new pilots. Needless to say, such ignorance can only puzzle one. But then certain graphs were needed to clear up a question and they had to spend a long time hunting for them, even though the leaders of the unit knew about the inspection in advance. That is atypical. But it shows that lack of organization and an improper attitude toward functional duties lead to difficulties in work. Incidentally, serious problems in flight training were also found in the regiment at that time.

We must fight against these and similar shortcomings. And one of the most reliable ways to eliminate them is practical, concrete, aggressive, and flexible work to teach officers, ensigns, sergeants, and soldiers a sense of personal responsibility for the assigned work and instill such qualities as discipline, exactitude in work, and diligence. Leader-officers and party and Komsomol organizations must focus their attention on this, use all proven forms and methods of political and military education and training to develop ideologically toughened, skillful, steadfast, and courageous aerial fighters.

During the summer months our aviation units and subunits are performing new, complex missions. It is the duty and sacred obligation of the flying defenders of our native land to bring us joy in this anniversary year with great advances in military labor, a further rise in the combat readiness of the Air Force, and fulfillment of the socialist obligations adopted in honor of the 60th anniversary of Great October.

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## AIR FORCE CIC ON COMBAT EMPLOYMENT OF AVIATION

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[Article by Chief Marshal of Aviation P. Kutakhov, commander in chief of the Air Forces and Hero of the Soviet Union: "The Use of the Air Force During Front Offensive Operations" (Published under the heading: "The Art of Warfare in the Great Patriotic War")]

[Text] During the years of the Great Patriotic War, front offensive operations were normally part of strategic operations. When these were conducted, air force formations played an important role. They fought for air superiority. They supported ground forces, providing effective help to combined arms and tank armies when they were breaking through the enemy's defenses, surrounding and destroying his groupings, forcing water boundaries, and seizing and holding on to bridgeheads. They performed aerial reconnaissance, fought against enemy reserves, participated in aerial operations by front groups, delivered supplies to troops, and performed other operational tasks. The air forces helped to increase the scope, dynamism and decisiveness of front offensive operations by means of their energetic combat actions.

Experience has shown that the air forces' main efforts were concentrated on supporting ground forces and fighting for air superiority. A total of 46.5 percent of the over-all number of sorties by front aviation was spent on solving the first mission and more than 35 percent of them on the second.<sup>1</sup> Long-range aviation played a significant role in carrying out these tasks.

The use of the air forces during front offensive operations bore the nature of combined combat operations with the ground forces. During the first period of the war (the counteroffensive at Moscow, Tikhvin, and Rostov) a number of critical shortcomings were displayed, namely: the lack of close and steady coordination between air force large units and ground force formations, the scattering of resources and efforts for the purpose of hitting a great number of objectives, and insufficient massing of forces on major avenues. This was explained by the lack of experience in our commanders, an unimproved air force organizational structure, the small number of aircraft, and other reasons.

Coordination between the air and ground forces during this period was organized at the combined arms army-aviation division (air group) level. Air force representatives were sent to the command posts of combined arms army commanders to maintain it. Their functions at that time consisted mainly of agreeing to coordination signals, transmitting requests for air strikes, and keeping people informed about the ground and air situation in the area of combat operations.

The troop commander of fronts and armies directed air force combat activity during front offensive operations through the appropriate air force commanders. After the formation of air armies, the front commander directed aviation's combat activities through the air army commander who was at the same time the deputy troop commander and member of the front's military council. Control of aviation was exercised from the air army command post at which the commander or his deputy and the sections and services, directly connected with conducting air force combat operations, were located.

In the majority of cases, an air preparation was conducted before a combined arms formation began an offensive. Since there were few daytime bombers and ground attack aircraft during the first period of the war, the preparation was often confined only to operations by night bombers. Obsolete aircraft--PO-2, R-5, etc.-- were used for this purpose. Light bomber aviation regiments were formed from them.

When the troops shifted to the offensive, large units of bombers and ground attack aircraft and often fighter aircraft were switched over to provide direct air support for infantry and tanks. Echeloned strikes by small groups of six-nine planes were the basic way of operating. They struck sequentially from median and high altitudes and with significant time intervals (three-five hours).

Incompleteness in (sometimes the lack of) the system for designating the forward edge of the battle area, for reliably designating targets and for controlling aviation over the battle field led to airmen, afraid of hitting their own forces, dropping their bombs 10-15 kms in front of them. Of course, the uncoordinated strikes, conducted at a considerable distance from the advancing units and large units, lacked sufficient effectiveness. On the one hand, the troops were not able to immediately use the results of the air operations and, on the other hand, enemy firing systems and personnel were not reliably suppressed. All this had a negative effect on the tempo of the offensive.

If aviation was used with a single purpose during the counteroffensive at Moscow, this can't be said about offensive operations during the winter of 1942--the Rzhevski-Vyazems kaya, Toropetski-Kholm'skaya, Barvenko-Lozov'skaya, and others. Combined arms armies, weakly supported from the air, slowly broke through the enemy's defenses and suffered unjustifiable losses. The Soviet army's Air Force commander wrote in a directive on 25 January 1942: "The employment of front aviation, considering its limited amount, is taking place incorrectly at the present time. Front air force commanders, instead of the single-purpose and massed use of aviation on main avenues against

the primary enemy objectives and groupings which are hindering the successful solution of the front's task, are scattering aviation resources and efforts against numerous targets on all sectors of the front. Massing the operations of aviation by front air force commanders for the sake of planned operations is done hesitatingly or is completely lacking."<sup>2</sup>

The serious blunders in using aviation during the spring of 1942 had a negative effect on the combat activity of aviation and the ground forces. During the offensive operations of the Northwest Front against the Demyanskaya enemy grouping (3-20 May 1942) and of the Southwest Front on the Kharkov Avenue (12-29 May 1942), aviation frequently operated in a decentralized manner. This excluded the possibility of concentrating its employment. Under these conditions, the enemy, without having numerical superiority in aircraft, normally seized the initiative in the air.

From the spring of 1942 on, the formation of air armies began. This permitted aviation to be used in a massed fashion during offensive operations and centrally controlled on a front scale. It created conditions for closer operational and tactical coordination with the ground forces. The introduction of radio sets played a large role in increasing the effectiveness of aviation's combat operations.

During 1941 and 1942 experience was received in fighting for air superiority and during the battle for Moscow we managed to achieve it.

In the area of a front's offensive, the struggle for air superiority was waged by systematically destroying enemy planes in the air and on the ground. Moreover, front aviation took part in air operations to destroy (weaken) opposing enemy air groupings.<sup>3</sup> All told during the first period of the war, one-third of all the efforts of front aviation were expended on the struggle for air superiority. The Hitlerite air forces noticeably decreased their activity. A total of 15,700 enemy aircraft were destroyed in aerial battles and on airfields by Soviet aviation. At the same time, our aviation industry achieved a considerable increase in the production of the newest models of aviation equipment and weapons. During 1941-1942, it delivered to the front 33,857 aircraft while Hitlerite Germany together with its allies and the occupied states of Europe put out only 20,857.<sup>4</sup> Thus, the successes won at the front and in the rear created the necessary prerequisites for finally achieving air superiority in 1943.

The Soviet Air Forces entered the second period of the war with the rich experience received during its single combat with a strong and savage enemy. Centralized control became the basic form of controlling the air forces on a front scale. This ensured broad use of the maneuver capabilities of aviation.

Auxiliary control points (VPU) were created in addition to the command and rear control points. They were located at a distance of 10-15 kms from the

front line. Radio communications became the main system for controlling aviation large units and units both in the air and on the ground.

Changes in the organizational structure of front aviation and the qualitative and quantitative growth of the air forces' aircraft pool were positive phenomena. At the beginning of the war, front aviation had only 19 percent new aircraft types.<sup>5</sup> However, by the summer of 1943, the rearmament with new aviation equipment was basically completed. The latest aircraft, designed during the war--LA-5, YAK-76, YAK-9 fighters, and TU-2 bombers--began to arrive in aviation units. The production of PE-2 bombers and IL-2 attack aircraft was expanded. The number of aircraft in air armies sharply increased. During the first period of the Great Patriotic War, front formations, advancing on the main avenues, had approximately 300-400 planes in their complement but 650-1000 during the second period.<sup>6</sup> The numerical growth of our air forces ensured the numerical superiority in aircraft over the enemy. At the beginning of the counteroffensive at Stalingrad, the ratio of forces was 1.1:1 in our favor but by July 1943 along the entire Soviet-German front Soviet air forces exceeded the enemy in aircraft by almost a factor of three.<sup>7</sup>

The summarization of the combat experience, received during the first period of the war, permitted a large step forward to be taken in the development of air force operational art. Air force combat operations began to be conducted in the form of an air offensive. It included all the best of prewar theories on the use of air forces in deep offensive operations and the best of the experience from combat operations during the Great Patriotic War.

An air offensive was planned for the first time and partly carried out during the counteroffensive at Stalingrad. During the winter campaign of 1942-1943, it was carried out to the depth of the ground forces breakthrough on all tactical defense zones (Velikolukskaya, Rzhevsko-Sychevskaya, Ostrogozhsko-Rossoshanskaya, Borsnezhsko-Kastornaya, and other operations).

When preparing an air offensive in the Kuban' during the spring of 1943, air force combat operations were planned not only for the purpose of conducting an air preparation and supporting troops when they broke through the defenses and battled in the rear areas but also for gaining air superiority.

Beginning with the counteroffensive at Kursk, the air offensive acquired a large operational scope. It was not confined to air preparation and support of the troops when breaking through tactical defense zones, but was conducted to the entire depth of the offensive operation and included a whole series of tasks which were solved by the air army during the offensive operation, namely: covering and supporting troops, protecting the commitment to combat (breakthrough) of front and army mobile groups and their support (escort) into the operational rear, the destruction of enemy reserves, the aerial blockade of surrounded groups and their destruction, combatting enemy aviation in the air and on the ground, and aerial reconnaissance.

Not only the widespread conduct of an air offensive but also more active participation in air operations, organized by the Headquarters of the Supreme



Command, were characteristic of the combat use of front aviation during the second period of the war.<sup>8</sup>

Beginning with the second period of the Great Patriotic War, such an important and new question concerning the operational use of air forces as the support and protection of a tank army during its commitment to battle (break through) and operating in the operational rear, began to be solved theoretically and practically during front offensive operations. This task was a component part of the air offensive and required the involvement of a large number of forces. During the Orlovskaya Operation a total of 120 attack aircraft, 112 bombers and 200 fighters from the 15th Air Army (its commander was Lt Gen Avn N. F. Naumenko) were allotted to the 3d Guards Tank Army when it was committed to battle.<sup>9</sup> This represented 63 percent of its combat forces.

The successful carrying out of an aerial blockade during the elimination of the surrounded enemy grouping at Stalingrad was a new phenomenon in air force operational art.

During the second period of the war our air forces achieved air superiority in a number of sectors along the Soviet-German front (the counteroffensive at Stalingrad, the battle in Kuban') and in the summer of 1943 seized the strategic initiative in the air.

In the summer-fall campaign of 1943 the air forces skilfully used maneuver. They rapidly shifted their main efforts in the front area from one avenue to another. The control of aviation was, as a rule, centralized. During the first stage of the winter campaign of 1942-1943, aviation control points were set up only at the headquarters of combined arms armies, but during the second (during the general offensive) the sending of liaison officers from the command elements of aviation corps and divisions directly to tank, mechanized and cavalry corps began to be widely practiced. This had a favorable effect on the organization and execution of close coordination between them.

During the second period of the war, side by side with the further development in the forms and methods of the combat employment of air forces during front offensive operations, there were a number of shortcomings. In particular, air armies fought during their day-to-day combat operations for air superiority in the areas of their own fronts, sometimes without coordinating their efforts with adjacent air armies. In some cases coordination with mobile forces was steady only for the first two-three days of the offensive and was subsequently broken. In individual operations (Orlovskaya, Belgorodsko-Khar'kovskaya, Smolenskaya) insufficient attention was devoted to the struggle against the enemy's operational reserves. This was the result of the higher combined arms and aviation command elements' underestimating the question of combatting enemy reserves, especially when they were concentrating before launching a counterattack, and the small number of daytime bombers in air armies.

During the third period our aviation continued to maintain air superiority. The size of the aircraft pool and the combat capabilities of the Soviet air forces increased considerably. This permitted combat operations to be conducted on a growing scale. Larger forces of front aviation, ADD [long range aviation] and the aviation reserves of the Supreme Headquarters began to be involved in offensive operations. For the beginning of the Belorussian offensive operation, there were 11 aviation corps, with more than 3,000 combat aircraft, in the 1st, 3d, 4th and 16th Air armies from the reserve of the Supreme Command. During the preparation for the L'vovski-Sandomirskaya offensive operation the 2d Air Army received 4 aviation corps and 2 air divisions. These included 1,440 combat aircraft.<sup>10</sup>

In sectors of the front where the troops were making the main attack, 1,500-2,000 and more aircraft operated: During the Berlin operation 2,700 planes from the 16th Air Army (its commander was Col Gen Avn S. I. Rudenko), i.e., 90 percent of its composition, were concentrated on the avenue where the troops of the 1st Belorussian Front, who were advancing from the Kyustrinskiy bridgehead, were making the main attack. Moreover, four aviation corps from the 18th Air Army (its commander was Chief Marshal of Aviation A. Ye. Golovanov) operated on this same avenue." This provided an opportunity to effectively conduct an air preparation and air support of the front's forces, successfully solve the task of achieving and maintaining air superiority, combat more decisively enemy reserves, and perform other tasks.

Concentrated and massed strikes by the forces of several aviation large units has become the primary method of operation when conducting an immediate air preparation. For example, during the Belorussian Operation, 160 daytime bombers from the 1st Air Army (its commander was Col Gen Avn T. T. Khryukin) participated in a mass strike inflicted at the end of an immediate air preparation in the area of the 3d Belorussian Front<sup>12</sup> and 252 bombers from the 2d Air Army - (its commander was Col Gen Avn S. A. Krasovskiy) in the L'vovski-Sandomirskaya Operation.<sup>13</sup>

During individual front offensive operations during 1944-1945, when Soviet forces had to break through especially strong defenses of the fortified area type for the purpose of destroying permanent defensive works and disorganizing the system of fire and troop control, a preliminary air preparation was conducted besides the immediate one (Vyborgskaya Operation, The storming of Koenigse<sup>o</sup>rg). Large units from the 18th Air Army and front and naval aviation participated in it. In order to conceal the planned sector of the breakthrough from the enemy, the preliminary air preparation was conducted on a broad front.

The nature of air support changed with the increase in the size and the growth in the combat capabilities of air armies. It began to exert a simultaneous influence on the entire tactical depth of the enemy's defenses by inflicting concentrated and massed strikes both on objectives located immediately in front of the advancing forces and on targets in the depths of the defense. In doing this, attack aviation operated in two echelons in

some Air Armies (the 1st Air Army in the Vostochno-Prusskaya Operation). First, enemy units directly in front of the attacking forces were destroyed. Then, strikes were inflicted on objectives in the area of the artillery positions and the second defensive belt. With the approach of the troops, the boundaries of operations for each echelon were correspondingly shifted.

Units and large units of different types of aviation performed air support in the operational rear. The control of aviation was strictly centralized and personally exercised by the air army commander. Decentralization was permitted as an exception only in certain cases (for example, in the L'vovski-Sandomirskaya, Vislo-Oderskaya, Vostochno-Prusskaya). It concerned only those aviation large units and units which were temporarily placed under the operational subordination of the front's mobile forces. Aviation large units and units operated in an echeloned manner on call of the air army commander's VPU or the aviation large unit commander's control point located in the vicinity of the combined arms (tank) army commander's command post. A portion of the bomber (attack) aviation forces normally were kept as the air army commander's reserve to solve tasks which arose suddenly (the 4th and 16th Air Armies in the Berlin Operation. The commander of the 4th Air Army was Col Gen Avn K. A. Vershinin).

The composition of the forces, allotted for support, depended on the availability of aviation and also on the mission of the combined arms army. During the second period of the war, one-two ground attack air divisions were allotted for support of a combined arms army advancing on the avenue of the front's main attack, but during operations in the third period, there were two-three and sometimes four attack air divisions and one-two bomber divisions. During the Berlin Operation, the 70th Army of the 2d Belorussian Front was supported by an attack aviation corps and two attack air divisions of the 4th Air Army while the 8th Guards Army of the 1st Belorussian Front was supported by an attack aviation corps and two bomber air divisions from the 16th Air Army.

Improvements in immediate air preparations took place along the line of shortening its duration and increasing the density of strikes, and improvements in air support went in the direction of increasing the depth of simultaneous action against the enemy and raising the proportion of concentrated and massed strikes.

The fight against the enemy's operational reserves was conducted more energetically during the third period of the war. Up to nine percent of the sorties were spent on solving this very important task.<sup>14</sup> The commanders of fronts, in order to defeat or repulse enemy counterattacks, primarily resorted to the help of aviation as the most powerful and mobile system involving from 20 to 50 percent of the large units of an air army in this. During the Berlin Operation, when repulsing a counterattack inflicted by the enemy from the area to the west of Gerlits, 30 percent of the 2d Air Army's forces took part in it. In two days (20 and 21 April) the airmen made more than 4,400 sorties, destroyed up to 50 tanks, and suppressed the fire of 10 artillery batteries.<sup>15</sup> The counterattack was beaten back.

When pursuing a retreating enemy, large aviation forces were involved in disorganizing the retreat and in destroying enemy troops and combat equipment. Depending on the situation, primarily on the availability of aviation forces, meteorological conditions and other elements, the fight against the retreating enemy was waged by different methods. In some operations (Korsun'-Shevchenkivska) systematic strikes by small groups of aircraft were inflicted on the retreating troops. In others (Belorussian, Vislo-Oderska) periodic concentrated strikes were inflicted on railroad objectives and enemy troop columns on the roads. Such actions by aviation wore down and exhausted the enemy forces, inflicted great losses on them and forced them to continually disperse. All this slowed down the retreat and led to the surrounding and destruction of enemy groupings.

During envelopment operations (Korsun'-Shevchenkivska, Bobruyska, Budapest, Yassko-Kishinevska, etc.) the air forces, besides general tasks (the fight for air superiority, air preparation, air support, aerial reconnaissance, etc.), solved a number of specific tasks, namely: helping the ground forces to surround enemy troops within and outside the front, breaking up and quickly destroying the surrounded groupings; disrupting enemy attempts to break out of the encirclement; preventing the approach of reserves; taking part in repulsing counterattacks in order to relieve troops; delivering ammunition and POL to friendly tank forces; performing an air blockade.<sup>16</sup>

During a strategic offensive, when the mobile forces of fronts were separated from their supply base, when lines of communications were disrupted during the spring and fall season of bad roads, and when the roads were impassable, only aviation was able to deliver fuel, ammunition and other supplies to them in time. The use of aviation during the war years for these purposes has already been discussed on the pages of the magazine.<sup>17</sup> It is necessary only to point out that, thanks to the involvement of aviation in delivering combat and other supplies, the Soviet forces, especially tank armies and corps, had an opportunity to exploit the offensive, without stopping and at a high tempo, deeply into the enemy's rear, to annihilate enemy reserves, to surround and destroy his groupings, and to seize operational lines quickly.

Aerial reconnaissance played an important role. For example, when preparing for the Berlin Operation, the airmen of the 16th Air Army of the 1st Belorussian Front made 2,600 reconnaissance sorties. This accounted for 41.6 percent of all those conducted by it during that period.

One of the most complicated problems in front offensive operations was the ensuring of timely moves by aviation after the advancing troops. Air armies were assigned reinforced engineer airfield battalions which followed in the combat formations of tank armies and rehabilitated and built airfields. Special reconnaissance groups were created to find sites for the construction of the latter. During some operations special tasks to seize and hold airfields until the approach of aviation rear area units were assigned to tank armies. Combined arms formations also assigned the necessary forces

and means to the construction and rehabilitation of airfields. However, this task was not always solved successfully during the first stages of some operations (Belorussian, Vislo-Oderskaya, etc.).

The movement of aviation without changing its base acquired great importance. During the Berlin Operation, when the forces of the 2d Belorussian Front were fortifying the Oder, Marshal of the Soviet Union K. K. Rokossovskiy, the commander, decided to direct the main effort where success was beginning--on the right flank--in the area of operations of the 65th Army. The commander of the 4th Air Army, Col Gen Avn K. A. Vershinin, needed only 30 minutes to concentrate all of aviation's main efforts to support the 65th Army.

It is characteristic that during the third period of the war large ADD (18th Air Army) units were participants in the area of this or that front in preliminary or immediate air preparations for the purpose of speeding up the breakthrough of the enemy's defenses. This was explained by the shortage of daytime bombers. For example, when executing the offensive at Leningrad and Novgorod, the composition of the 13th Air Army of the Leningrad Front had, all told, 86 daytime bombers and the 14th Air Army of the Volkhovskiy Front--43. There generally were no daytime bombers in the air armies of the 1st Baltic and 2d Belorussian fronts during the operations to liberate Belorussia. When conducting the Yassko-Kishinevskaya Operation, the 5th and 17th Air Armies of the 2d and 3d Ukrainian fronts had all told 320 bombers, of these about 200 (62 percent) were PO-2 aircraft.<sup>18</sup>

Therefore, when conducting front offensive operations, air force art was enriched by a whole number of new propositions, in particular, the air offensive was born and constantly improved during the war years. The scale of using air forces grew from operation to operation. The circle of tasks solved by them was enlarged, and methods of operating in combat were improved.

Experience from the Great Patriotic War has shown that the wide use of aviation formations and large units to carry out various tasks increased the decisiveness and dynamism of ground force offensive operations. Without the active participation of aviation it would have been impossible to count on success in conducting front offensive operations. The main merits of aviation were (and are today) its long range, mobility and great striking power. Moreover, aviation units and subunits are on their own capable of running to earth and quickly destroying small size and mobile objectives.

Air preparation for an attack was an integral part of the majority of offensive operations and was divided into preliminary and immediate preparations. Preliminary air preparation primarily took place during operations where the troops had to break through an especially strong defense of the fortified area type (Vyborgskaya, Vostochno-Prusskaya Operation). An immediate air preparation usually began during the night before the offensive and ended at daylight with a strike by large forces from bomber aviation. This coincided with the time of the artillery preparation for the attack. Up to 1943 concentrated strikes composed of a regiment-division were used during front

offensive operations and in 1943-1945--massed strikes. In each of these, several air divisions took part. Attack aviation either was completely not involved in conducting the immediate air preparation or was only partially involved (10-25 percent of it). This was done to preserve the main forces of the attack aircraft for the effective support of combined arms (tank) large units.

Air support of the ground forces on the battlefield required accurate organization, target designation and mutual designations especially if the strikes were laid down at the minimum distance from our forces. The nature and methods of aviation's combat operations, when solving air support tasks, were selected based on the degree of the enemy forces' resistance, the number of firing systems in his defenses, the capabilities of combined arms armies to suppress on their own and to destroy enemy objectives on the battlefield and in the depths, and the availability of aviation resources.

The effectiveness of air army combat operations during front offensive operations depended a lot on their coordination with the combined arms (tank) army command element. The front commander organized coordination between the front forces and the air army. He defined the tasks and work effort of aviation for stages of the operation, objectives and periods of actions as well as general coordination matters. The command element of combined arms (tank) armies firmed up with the air army's representatives the specific tasks, place and time for the operations of air large units assigned to support these armies. Coordination plans pointed out the forces, systems and methods of air support, mutual identification and target designation signals, methods for calling for air strikes, and aviation control points.

In order to improve control and coordination, the areas where aviation was based were brought nearer to the front lines (fighters--up to 50 kms, ground attack planes--up to 100 kms, bombers--up to 150 kms) from March 1942 on. When preparing for and conducting front offensive operations auxiliary control points (VPU) were set up in air armies, and operational groups of officers with radios were sent from aviation large units to the supported combined arms army. Radio became the primary method of control and for maintaining coordination.

During the war years both the tactical and operational coordination of aviation with the ground forces was basically carried out on the support principle. This principle seems most advisable. The shift to centralized control of aviation on a front scale and accurate coordination of the efforts of aviation formations and large units permitted it to be used in a massed way on decisive avenues.

Combat experience showed that without centralized control of aviation on a front scale it was impossible to complete in a short time a maneuver to create decisive superiority over the enemy on the required avenue. In doing this, it was advisable to move aviation within the front by having the

flight crews go by air in combat aircraft and ground services displace by vehicular transport. Maneuvering by changing the radius of operations deserves attention as being more economical, transient and not requiring the preparation of airfields in new staging areas and the move of support units to that area.

During the last war the operational concealment of air bases and their moves acquired exceptionally large importance. Concealing bases was done by setting up dummy air groups on secondary avenues and networks of dummy airfields (30 percent of enemy air strikes were inflicted on dummy airfields); camouflaging aircraft, VPP [landing strips], and control systems; and providing for secure control. Secrecy of maneuver was achieved by flying under complete radio silence and by small groups flying at low altitudes for the shortest period of time. Rear area security measures for the combat operations of aviation were also carried out while observing camouflage measures.

Experience shows that air superiority is an indispensable condition for successful combat actions by combined arms and tank formations and that it is necessary to achieve it before the front troops launch an offensive.

Aerial reconnaissance was conducted during front offensive operations: operational--to a depth of 150-300 kms and tactical-- to 100 kms. With its help, enemy defense lines and groupings of troops, the direction of withdrawal, the commitment and moving up (approach) of reserves, airfields at which aviation was based, and the number and type of aircraft on them were brought to light. Constant observation of the battlefield was conducted from the air.

Aerial reconnaissance was conducted in two ways--visual observation and aerial photography both by organic reconnaissance units and by non-T/O subunits from aviation large units as well as by crews of all types of aviation specially or incidentally to the carrying out of combat missions.

By the end of the war, on the average up to 20 sorties were made each day for the purpose of conducting operational aerial reconnaissance.<sup>19</sup> Aerial reconnaissance was regarded by the command element of fronts as one of the primary ways to provide the most valuable and reliable information about the enemy.

Thus, the Great Patriotic War provided quite a bit that was new and instructive in using air forces during front offensive operations. Much of this experience has not lost its practical importance and remains valid under modern conditions.

#### FOOTNOTES

1. "Sovetskiye Voenno-Vozdushnyye Sily v Velikoy Otechestvennoy voyne 1941-1945 gg" [Soviet Air Forces During the Great Patriotic War], Voenizdat, 1968, pp 438 and 441.

2. TSAMO SSSR [Central Archives of the Ministry of Defense], f 346, op. 52133, d.3, ll. 89-90.
3. VOYENNO-ISTORICHESKIY ZHURNAL, No 6, 1972, pp 25-30.
4. "Sovetskiye Voyenno-Vozdushnyye Sily v Velikoy Otechestvennoy voyne 1941-1945gg", pp 118-119.
5. "Istoriya voyn i voyennogo iskusstva" [History of Wars and the Military Art], Voenizdat, 1970, p 100.
6. TSAMO, f. 368, op. 205482, d.7, l. 197.
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8. For details cf. VOYENNO-ISTORICHESKIY ZHURNAL, No 6, 1972, pp 20-28.
9. "Sovetskiye Voyenno-Vozdushnyye Sily v Velikoy Otechestvennoy voyne 1941-1945gg", p 919.
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14. "Operatsii Sovetskikh vooruzhennykh sil v Velikoy Otechestvennoy voyne 1941-1945. Voyenno-istoricheskiy ocherk" [Operations of the Soviet Armed Forces During the Great Patriotic War--1941-1945. A Military Historical Essay], Voenizdat, Vol 3, 1958, p 797.
15. "Sovetskiye Voyenno-Vozdushnyye Sily v Velikoy Otechestvennoy voyne 1941-1945 gg", p 404.
16. VOYENNO-ISTORICHESKIY ZHURNAL, No 9, 1975, pp 97-102.
17. Ibid. No 2, 1974, p 28; No 8, 1975, pp 24 and 69; and No 9, 1975, p 99.
18. "Operatsii Sovetskikh Vooruzhennykh Sil v Velikoy Otechestvennoy voyne 1941-1945. Voyenno-istoricheskiy ocherk," Vol 3, p 798.
19. VOYENNO-ISTORICHESKIY ZHURNAL, No 11, 1973, p 35.

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## WARTIME ANTISUBMARINE OPERATIONS DISCUSSED

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[Article by Capt 1st Rank A. Basov, doctor of historical sciences: "Combatt-  
ing Enemy Submarines" (Published under the heading: "The Art of Warfare  
in the Great Patriotic War")]

[Text] During the Great Patriotic War more than 150 enemy submarines operat-  
ed against the Soviet Navy and transport ships. Of these, there were more  
than 100 German ones in the North, 37 (32 German and 5 Finnish) in the Baltic  
and 15 (6 German, 6 Italian and 3 Romanian) in the Black Sea. <sup>1</sup> Combatting  
them was one of the important tasks of our fleets.

First of all, it was necessary to create at the beginning of the war a  
reliable anti submarine defense. In accordance with the views then existing,  
the operational operating zones of fleets were divided into naval base regions  
in which special large units--seaward defense organizations (OVR) handled the  
antisubmarine defense. Beyond the limits of the bases, large units of  
ships had to battle against submarines while they were carrying out operational  
tasks. Ship movement security was provided by the convoy system.

In the Soviet navy, small submarine chasers of the MO-IV type ( sometimes  
they were called "sea hunters") were used as specially constructed anti-  
submarine vessels. Their displacement did not exceed 56-60 tons. They  
possessed good seagoing qualities and high speed (up to 27 knots) and had the  
necessary weapons. At the end of the Great Patriotic War, antisubmarine  
vessels of a new type--large submarine chasers (BO-1) began to enter the  
fleets. Part of the ships, mobilized from civilian departments, were  
especially equipped to combat submarines.

A special place in the antisubmarine struggle was given to the establishment  
of barriers. During the first months of the war the fleets laid antisubmarine  
mines and nets in bays and on the roadsteads associated with them in order to  
prevent enemy submarines from entering. A system to observe submarines  
(shore posts, ship patrols, search aircraft, and ships and vessels crossing  
the sea) was organized. Methods for searching for and attacking submarines  
were also devised.

In this way the fleets had created a reliable antisubmarine defense by the autumn of 1941. Seaplanes and more than 100 ships and launches were actively involved in combatting submarines. Moreover, various barriers were used.

Let us take the Red Banner Baltic Fleet as an example. Its command element undertook active measures against enemy submarines. A special antisubmarine minefield was laid in the mouth of the Gulf of Finland. There were ten clusters of mines on the exit channels from the Finnish skerries. At the same time, small submarine chasers and torpedo boats laid 387 mines and 89 mine defenders in the channels on the exits from Helsinki, Porvoo and Borga and minelaying and torpedo aircraft laid 107 bottom mines in the depths of the skerries.

Mine fields hampered the operations of enemy submarines but were not able to eliminate their menace completely. Therefore, the KBF [Red Banner Baltic Fleet] began to set up antisubmarine nets and booms to barricade the Luzhskaya Bay where it was planned to set up a mobile fleet base. The Tallinskiy roadstead was barricaded with nets at the beginning of August. Subsequently, nets were placed on individual segments of the Tallin-kronshtadt sea lane. It was as if they created a "fence" which protected our maritime communications from the north. All told in 1941 they managed to emplace nets with an overall length of about 38 miles and more than 8 miles of booms.<sup>2</sup>

The antisubmarine defenses in the Gulf of Finland were complex: positioned barriers as well as an active search for submarines by vessels and aircraft. In order to get to our lines of communications, Finnish submarines had to pass through an area of mine clusters and the observation zone of SNiS [Observation and Communications Service] posts and search aircraft. On the southern part of the gulf, where the channels passed, they had to force nets, get around patrol vessels and overcome convoy screens. Submarines were not able in the majority of cases to cross all these obstacles and returned to the skerries without having fired a single torpedo.

The KBF's struggle against submarines in 1941 included the defense of base areas, the protection of transports and large combat vessels on voyages, and the active search for submarines in the sea. The shortage of special anti-submarine forces was partially filled by various auxiliary vessels and aircraft. The use of heterogeneous forces and various combat methods hampered the submarines' operations. A total of 740 transports and 1,170 combat vessels and launches, which carried 190,000 men, 8,000 horses, 670 guns, 63 tanks, about 8,000 vehicles, about 29,000 tons of ammunition, and more than 1,000 tons of fuel, food and other supplies, moved along sea lines of communications in convoys without losses in 1941.<sup>3</sup>

Our submarines were also involved in the antisubmarine fight while carrying out their combat missions. For example, on 10 August the SHCH-307, commanded by Capt Lt N. I. Petrov, while returning to base and having surfaced to periscope depth near Dago Island, discovered the enemy submarine, U-144, on the surface. It attacked and sank it.<sup>4</sup>

During the 1941 summer-fall campaign enemy submarines presented practically no hindrance to the movement of convoys in any naval theater. This was caused by two major factors: first, the Soviet navy set up a reliable anti-submarine defense in a short period and, second, the small number of enemy underwater forces. A total of 3 and then 6 submarines operated in the Barents Sea during 1941, 6-8 German and 5 Finnish in the Baltic Sea, and only one Romanian boat, the "Del'finul", in the Black Sea.<sup>5</sup> At the same time the effectiveness of antisubmarine forces was still low at that time. This was caused by the level of their technical equipment and the lack of combat experience.

In 1942, the Hitlerites concentrated their principal large surface vessels, a flotilla of submarines (more than 20) and the 5th Air Fleet in the north of Norway. They were given the task of isolating the USSR and disrupting external maritime communications.

In the Baltic Sea, the enemy's goal was to achieve freedom of movement for their own vessels by completely blockading the Soviet fleet in the eastern part of the Gulf of Finland. To do this, he used his submarines, at first, to the west of the line of minefields in the Gotlandskaya antisubmarine system; then-- in direct security of convoys at sea and, finally and more successfully--to search on their own for Soviet submarines in areas where they charged their storage batteries. All told, 10-11 submarines performed these tasks.

In the Black Sea the enemy navy's main task was to supply the ground and air forces.<sup>6</sup> At the same time, he had to hamper operations of the Soviet fleet and naval transport. For this purpose, the 11th Flotilla of Italian submarines was sent to the Black Sea in August of 1942. These were small submarines of the SW type whose displacement, when submerged, was 45 tons. They had two 450-mm torpedoes. Their speed was 7.5 knots on the surface and 6.5 knots submerged. The crew consisted of five men. Their small radius of operation (about 90 miles) limited their use. They required bases located near to sea lanes of communications. In May, six of these boats were sent to the Crimea and were based at Yalta. They participated in the blockade of Sevastopol.

Thus, in 1942 37-38 enemy submarines were operating against the Soviet Navy.<sup>7</sup> During that period, the Northern Fleet waged the most active struggle against enemy submarines. The German fascist command from March 1942 really began to conduct operations in the north against the convoys, travelling to the Soviet Union with military cargoes and in the opposite direction with raw materials. These operations involved aviation, submarines and surface ships. From 7 to 23 boats took part simultaneously in each operation.

This required the swift development of the Northern Fleet's antisubmarine forces and systems. Before the approach of a convoy, patrols were intensified. Controlled searches for submarines were conducted on the approaches to the Kola Peninsula. The channels were swept. Aviation struck airfields and

bases. When the convoy arrived in the Northern Fleet's zone, destroyers and escort vessels were included in protecting the transports.

Here is one example from the battle of surface vessels against submarines.

The destroyer "Gremyashchiy" (its commander was Capt 2d Rank A. I. Gurin) was screening convoy RQ-13 on 13 March 1942. At 1915 hours the conning tower of a submarine moving to attack the closest transport was detected among the waves. The destroyer quickly hurried to it and dropped nine large and eight small depth charges. The attack was disrupted.<sup>8</sup>

The definite success of the antisubmarine defense is explained by the purposeful use of all the Northern Fleet's forces to protect convoys and oust submarines from certain areas. During attacks, the North Sea sailors dropped a large number of depth charges (from 12 to several dozen). This covered possible mistakes in determining the submarine's location and increased the probability of its destruction. However, detected submarines still were not subjected to protracted pursuit because the fleet did not have the necessary antisubmarine forces available for this.

In 1943, the task of combatting enemy submarines also became a real one for the Black Sea Fleet when six German submarines were transferred to that area. The German fascist submariners were successful in acting against our transportation. On 31 March 1943, they damaged the tanker "Kreml'" with a torpedo. However, it stayed afloat and reached Batumi under its own power. On 15 July the submarine, U-24, sank the minesweeper "Zashchitnik." Then, attacks followed on motor boats and other small targets. Moreover, the submarines fired at trains on the span between Tuapse and Sochi. All this required that urgent measures be taken to strengthen the defenses. Anti-submarine forces were strengthened by moving launches from Kaspi, Ladoga and the White Sea. The number of reconnaissance aircraft was also increased. Personnel underwent accelerated special training. Minefields and boom and net barriers were placed near ports and bases.

The measures which were taken lowered the losses of our ships and in 1944 the antisubmarine struggle in the Black Sea Fleet acquired an offensive nature. In the summer of 1944 aviation laid mines on the approach to Constanta and in the mouth of the Danube. Aircraft systematically searched for submarines under way in the middle of the Black Sea. Search and strike groups of antisubmarine launches, which pursued each detected submarine were deployed in the ports of the Caucasus and then those of the Crimea. As a result of the adopted measures, losses from submarine attacks did not exceed two percent of the over-all number of vessels travelling on the sea lanes.

At the beginning of the Yassko-Kishinevskaya operation, the Black Sea Fleet's aviation struck enemy ships in the ports of Constanta and Sulina. As a result a large number of ships were sunk, including the German submarine, U-9. Two boats (U-18 and U-24) received serious damage and because of their

unreliable condition were scuttled by their crews. The last three German submarines (U-19, U-20, U-23) were scuttled by their crews near the Turkish shore after Romania and Bulgaria left the war.

In 1944, the struggle against enemy submarines was renewed in the Baltic Sea. From June to September, 10-12 German and 5 Finnish submarines tried to disrupt the assistance of KBF forces to the ground forces in the Gulf of Vyborg and the sweeping of the channels through the Gotland mine and artillery position in the Gulf of Narva. They attacked with torpedoes any vessels down to launches, not excluding small subchasers. The enemy sank several combat launches using acoustic homing torpedoes. This created a tense situation throughout the eastern part of the gulf.

The plans and tactics of the enemy finally became clear to the KBF command after the small subchaser, No. 103, which was under the command of Sr Lt A. P. Kolenko, sank the German submarine, U-250 in the Gulf of Vyborg on 30 July. Six members of the crew, including the commander V. Schmidt, were thrown to the surface and were picked up by the small subchaser. The German submarine was raised and brought to Kronshtadt in September. Codes, instructions and cipher machines were taken from the compartments. The disclosure of all data on the newest acoustic homing torpedo, the T-5, was very important.

The events in the Gulf of Vyborg and the attacks of German submarines in other areas required the activation of a complete system of antisubmarine defense and the broader involvement of aviation in the battle against submarines. Mine fields were laid on the exits from the skerries in the Gulf of Vyborg. They began to send two launches on patrol. These were only ordered to be under way.<sup>9</sup> If submarines were detected by aircraft or other means, the launches were used as a search and strike group. This decreased quite a bit the time from the moment of detection to the beginning of the search. The special 29th Antisubmarine Air Squadron was formed. At the same time, aircraft from the 15th Independent Reconnaissance Air Regiment and the 9th Bomber Air Division were systematically involved in the search for submarines.

It was rare that a submarine, having gotten into the sea, remained undetected and was not attacked by the antisubmarine forces. More than half the submarines, operating on the sealanes, were damaged by the launches and aviation.<sup>10</sup> Having become convinced of the activity of Soviet antisubmarine forces, the enemy limited his use of submarines during daylight hours.<sup>11</sup>

From June to September 1944, the fleet's antisubmarine forces repulsed numerous attacks by 15-17 enemy submarines. The enemy was not able to prevent KBF ships from helping the ground forces during the Vyborgskaya offensive operation. He was also not successful in interfering with our ships' sweeping in the Gulf of Narva. By the beginning of the Tallinskaya offensive operation, the minesweepers had made passages through the southern flank of the Gotlandskiy fortified position. Launches and ships moved to the West, helping the ground forces.

In order to impede the operation of enemy submarines in the western part of the Gulf (to the west of Nais Saar Island, seven lines of minefields (594 mines) were laid by the 10th Minesweeper Battalion commanded by Capt 3d Rank F. Ye. Pakhol'chukh on the enemy channels.<sup>12</sup> The submarines, U-676 and U-745, were blown up on these mines in January and February 1945.

At the end of 1944 antisubmarine forces were deployed along the whole northern coast of the gulf for the antisubmarine protection of the Stockholm-Leningrad sea lane. A brigade of skerry vessels and the 6th Red Banner Small Subchaser Battalion were transferred to the Aland Islands. There were antisubmarine forces also on Hanko and in the area of Porkkala-Udd.

By the beginning of 1945, 90 of the 138 small subchasers and escort launches were equipped with sonar stations. The number of detections of submerged enemy submarines increased abruptly. On 9 January 1945, six minesweepers under the protection of three small subchasers moved from Tallin to lay mines in the mouth of the Gulf of Finland. During the move, MO-124, commanded by Sr Lt N.D. Dezhkin, made sonar contact with a submarine. It attacked and sank it.<sup>14</sup>

Our aviation and submarines operated against the enemy's underwater fleet in the middle and southern part of the Baltic Sea. The fleet's air forces during the period September-October made eight bombing and strafing attacks on the port of Liyepaya (about 350 sorties by bombers and ground attack aircraft). The primary purpose was the destruction of transports; however, several submarines also were damaged.<sup>15</sup> The German fascist command was forced on 4 October to move the submarine flotilla from Liyepaya to the Gulf of Danzig. During the period October-December 1944 our submarines placed 80 mines in the vicinity of Kolberg, Sassnitz, Bruster Ort and Bornholm Island. All this considerably lowered the effectiveness of the enemy submarines' operations.

The bourgeois historian J. Meister in his book, "Voyna na more v vostochnoyev-ropeyskikh bodakh v 1941-1945gg" [Naval Warfare in East European Waters During 1941-1945], explains the low effectiveness of the German submarine's operations as follows: "Because of the absence of suitable targets, the German and Finnish undersea war did not have any great success in 1944 and hardly could have any effect on the general situation. The Russian anti-submarine defense was aggressive."<sup>17</sup> In actuality, German submarines didn't have any material effect on the change in the combat situation. However, this happened not because of "the absence of suitable targets," since hundreds of transports sailed in the Gulf of Finland in 1941, 1944, and 1945. The fact was that the KBF's antisubmarine defense was not only aggressive but also quite skilful, and primarily skilful in massing antisubmarine forces on the decisive avenues.

In 1944, the effectiveness of the struggle against submarines was also raised in the Northern Fleet. The following circumstance contributed to a considerable degree to this. Soviet aviation maintained air superiority in the North. The number of ships and aircraft grew quickly and their technical equipment improved.

A brigade of escort ships was formed in 1944 and then a brigade of submarine chasers. A total of 77 aircraft were allocated to search for submarines. These were able to carry 280 antisubmarine bombs at one time. Nine destroyers, received from the break-up of the Italian navy, arrived from England in August of the same year. All this created real possibilities for increasing the effectiveness of the struggle against the German fascist submarines.

Destroyers, torpedo boats, submarines and aviation were used for this purpose. Each detected submarine was subjected to attack and pursuit. During the last four months of the war, 6,300 depth charges and 250 aerial bombs were dropped on the enemy. Many boats were damaged and three were sunk.

On the whole, convoys were successfully escorted to the northern parts of the Soviet Union. Out of 40 convoys, numbering all told 811 transports, 33 ships returned to their bases for various reasons and 58 were sunk, i.e., losses were about 8 percent. Out of the convoys returning from the Soviet Union, 24 transports were sunk--less than 4 percent. During this period, the Northern Fleet and the navies of the allies sank 38 enemy submarines.<sup>18</sup>

Thus, during the Great Patriotic War, the struggle of surface ships against submarines was constantly perfected. During the first years it had little effect. This is explained by the shortage of ships and their poor technical equipment. During the last years of the war these shortcomings were overcome. New antisubmarine ships and launches arrived in the fleets which had more modern instruments for underwater surveillance. In 1944 there were about 100 sonar stations on ChF [Black Sea Fleet] ships and launches; by the end of the war about half of the 218 antisubmarine ships and launches in the SF [Northern Fleet] were equipped with sonar equipment.

Aviation not only supplemented the search of surface vessels but also significantly enlarged our forces' zone of operations against enemy boats. During the first years of the war aircraft, which had no technical detection equipment, were used for visual searching. Subsequently, the number of aircraft increased and their technical equipment improved. For example, 65 planes were used for ASW purposes in the SF in 1942 and 125 planes in 1942. During the war SF aviation made 7,045 sorties in search of submarines and detected 73 of them, making 47 attacks on them. ASW aviation in the ChF in January 1943 numbered 27 aircraft and 75 in May 1944. During the entire war, ChF aviation made 8,669 sorties in search of submarines.

During the war our surface and air forces developed two methods of searching for submarines: systematically and on call. Systematic searching was performed by a group of ships (launches) usually consisting of 2-4 units or by two aircraft (sometimes by launches and aircraft working together) in areas planned in advance. On-call (from shore observation posts or from ships and aircraft at sea) searching was performed by ships to whom the search area and period for performing it were pointed out.

When searching, launches normally moved in line abreast at a distance of 5-15 cable lengths. In the SF, destroyers with good sea-going abilities,

more modern sonar equipment, and a large supply of depth charges (up to 150) were most effective in solving the tasks of searching for and destroying submarines. On 9 December 1944 in the Barents Sea six destroyers were conducting a search for submarines in three groups with a distance of three miles between groups and 14 cable lengths between the paired ships. As a result of the search they detected 2 submarines. One of them was sunk. Besides searching for boats, ship antisubmarine patrols consisting of 2-3 launches were conducted within the operational zones of naval bases. The distance of the patrols from the bases was on the average ten miles.

Search and strike groups (PUG), which searched daily for submarines in the operational zones of naval bases, began to be used in the struggle against submarines during 1943-1944. Subchasers, escort vessels and ASW aircraft were included in the composition of these groups. For example, the PUG, making a systematic search for submarines in the Sochi-Batumi sector in April 1944, consisted of five small subchasers and six MBR-2 aircraft. PUG's also were included in the cruising formation of a convoy. This permitted the timely detection and attack of submarines, without letting them get to the transports.

Experience from the Great Patriotic War has shown that during the fight against submarines the most serious problem was their detection when they were submerged. The rapid development of sonar equipment played a very important role in this. Barriers consisting of mines and nets, especially if they acquired the nature of protected positions, had great importance in enclosed and shallow sea basins.

The struggle against enemy submarines, which were the striking force in naval theaters until the very end of the war, exceeded the limits of antisubmarine defense as a form of combat security and became one of the primary tasks of the navy.

Heterogeneous forces (surface vessels, aircraft, and submarines) were used to combat submarines. They were used depending on the specific situation and level of the forces' equipping with special technical systems. The combined use of forces with close coordination between them had the greatest effect.

The organization of the antisubmarine defenses for the zones of naval bases proved itself on the whole. At the same time, the daily struggle against submarines required that it be organized as a single process throughout the theater, that various forces of the fleet be involved in it, and that forces be maneuvered within the theater and between theaters in order to mass in the most threatened region.

The movement of transport vessels in convoys was the most advisable way to protect them from submarines. The convoy system, as a rule, went with the protection of all sea lanes. Search and strike groups, consisting of ships and airplanes, played an important role.

The struggle of antisubmarine forces against submarines confirmed quite graphically that its outcome is decided not by simple numerical superiority



but primarily by more improved technical detection systems and the destruction of the enemy by a quantitative superiority of forces and systems which corresponds to the development level of naval art.

Under modern conditions, the weapons, cruising capacity, diving depth, speed, and range of submarines have grown significantly. In connection with this growth in submarine capabilities and the widening of their tasks, the importance of the battle against them has grown, and the role of coordinating heterogeneous forces has grown.

The antisubmarine forces of the Soviet Navy are capable of solving the tasks facing them. They have the necessary systems for detecting and destroying them. They have antisubmarine ships and aviation available which can fight against submarines in the far regions of the seas and oceans.

#### FOOTNOTES

1. B. Herzag, "U-Boote im Einsatz 1939-1945" [U-Boat Employment], Pouzun-Verlag, Dorheim, 1970, pp 45,46 and 86.
2. TSVMA [Central Naval Archives] Section, f.3, d. 33113, l. 126.
3. Ibid., F.88 d. 37022, ll. 51-52.
4. Ibid., f.3, d. 33113, l. 74.
5. K. Denits, "Nemetskiye Podvodnyye lodki vo vtoroy mirovoy voyne" [German Submarines During the Second World War], (Short Translation), Moscow, 1964, p. 173.
6. "Sovershenno sekretno! Tol'ko dlya komandovaniya!" [Top Secret! For the Command Only!] Documents and materials. Moscow, 1967, p 384.
7. From June 1941 to May 1944 the Hitlerites sent 89 submarines (13 in 1941, 33 in 1942, 20 in 1944 and 23 during the first five months of 1944) to northern Norway. They operated on the sea lanes from Iceland to Dikson Island and the Vil'kitskiy Straits. The naval forces of the allies and the Soviet Northern Fleet fought them. From June 1944 to May 1945 another 129 submarines arrived in Norwegian ports. Of these more than 30 operated in the Arctic seas.
8. TSVMA Section, P. 11, d. 35526 l. 239 reverse; f. 47, d. 8394, l. 32.
9. Ibid., f. 85, d. 25109, l. 118. In this case, having attacked one of launches, the submarine itself was subjected to the attacks of the other.

10. J. Meister, "Der Seekrieg in den oseeuropaischen gewässern 1941-1945"  
[The Sea War in East European Waters], Munich, 1958, pp 90-91.
11. TSVMA Section, f. 260, d. 13764, l. 282.
12. The aircraft laid 125 mines against submarines in the Irbenskiy Strait.
13. [Omitted in text].
14. The U-679 left Libava on 4 February 1944. The German command supposed that it had perished, having been blown up by mines on the night of 10 January ("The Fate of German Submarines 1939-1945," published by the newspaper HEIDENCHEIMER ZEITUNG).
15. The submarine, U-717, was put out of action by the bombing attack.
16. At the end of 1944, three German submarines, the U-549, the U-2342 and the U-367) were blown up by mines and sank.
17. J. Meister, op. cit., p. 91.
18. S. Roskill, "Flot i voyna" [The Navy and the War], Vol 3, Moscow 1974, p 548; TSVMA Section, f. 11, d. 17814, ll. 61 and 62.

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## CIVIL DEFENSE TRAINING ACTIVITIES

### Editorial Stresses Vigilance

Moscow VOYENNYE ZNANIYA in Russian No 6, Jun 77 signed to press 12 May 77 p 1

[Editorial: "Be on the Alert!"]

[Text] Thirty-six years ago Hitlerite Germany treacherously attacked our peace-loving nation, confirming the aggressiveness inherent in imperialism. This was the beginning of the Great Patriotic War of our freedom-loving people led by the Communist Party, the most difficult of all the wars they have ever experienced. We conquered the aggressor, drove the occupiers from our land and totally or partially liberated eleven nations of Europe and Asia. Each of those 1,418 days of war took an enormous effort on our part, however, and we suffered tremendous losses!

A historic world victory was achieved. It marked a real triumph for the Soviet social and state structure, born of the Great October Socialist Revolution, a triumph for the socialist economy, Marxist-Leninist ideology and the moral-political unity of our society, the fraternity of peoples of the USSR.

We are already in the fourth decade of our peaceful life. And peace reigns primarily because the Soviet Union is powerful and the socialist comity indestructible. Due to the tireless efforts of the CPSU Central Committee, its Politburo and Comrade L.I. Brezhnev, General Secretary of the CPSU Central Committee, personally, it has been possible to turn from "cold war" to a relaxation of tensions, which is in keeping with the aspirations of all progressive mankind.

The world is changing and the concepts of socialism are embracing more and more millions of people. It is precisely this which is evoking anger and class hatred in all kinds of imperialists. Imperialism's aggressive nature has not diminished in the least. Such is its essence, its nature. And today, as in the past, we must remember V.I. Lenin's bidding: "... Whoever forgets about the danger constantly facing us, a danger which will not cease so long as world imperialism exists, whoever forgets about this will also forget about

our labor republic." This thought on the imperialists' intrigues, on the need to counter them with vigilance was also stressed in materials of the 25th CPSU Congress.

The world thirsts for detente, while reactionary forces attempt to turn it back towards confrontation and continue the arms race so burdensome to the people.

NATO and the other aggressive blocs are extremely active. Military expenditures in the western nations, primarily the United States, have reached unprecedented size. In this largest of capitalist nations, where the Pentagon "hawks" and bigwigs of the military-industrial complexes have such influence, they are striving to create new models of nuclear-missile weapons and to improve existing ones.

Under these conditions the Soviet Union and the other socialist nations are exercising proper vigilance and concerning themselves with improving their defense capability. It was declared in a most definite manner at the 25th CPSU Congress that so long as the NATO bloc is retained, so long as militaristic groups engage in the arms race the Soviet Union, together with other participants in the Warsaw Pact, will strengthen that military and political alliance.

No one will ever catch us unprepared. We pose a threat to no one and plan to attack no one. This would be unnatural for a nation which has proclaimed slogans of peace and democracy from the very first days of its existence. We are prepared to repel an aggressor, however.

Expressing the thoughts of the entire nation Comrade L.I. Brezhnev stated at the October (1976) Plenum of the CPSU Central Committee that we will spend as much on defense as is required to insure the security of the Soviet Union, to defend the achievements of socialism jointly with fraternal nations.

The Soviet people led by the party have created developed socialism and are confidently continuing their advance along the communist route. They labor tirelessly and are greeting the 60th anniversary of the Great October Socialist Revolution with important achievements in all areas. They fervently love their Soviet homeland and guard its tranquility vigilantly and in the Leninist manner as they increase the national wealth.

Vigilance, alertness and readiness to block any intrigues by our foes are inherent in all Soviet patriots. These qualities are especially needed in the fighting men, however, the armed defenders of the homeland.

Our fighting men say that vigilance is a reliable weapon, a weapon which is never placed on the shelf. It is manifested at one's post, on combat duty, throughout all army and navy life. It is based on a high level of awareness, a feeling of duty, loyalty to the military oath.

Our defense Society and civil defense have an exceptionally great role in indoctrinating the Soviet people, primarily the youth, in a spirit of patriotism, a readiness to defend the accomplishments of the Great October Socialist

Revolution and constant vigilance. We must use the example of the generation which bore all of the burdens of the last war on its shoulders to demonstrate to the youth what it means to fulfill their patriotic duty in a worthy manner, to be loyal to the homeland.

All of the work of DOSAAF and civil defense is aimed at strengthening the nation's defense capability, and this places special responsibility on each of us. The duty of the patriotic Soviet citizen obligates us to be vigilant always and in all things.

Our vigilance is essentially revolutionary. It is of a truly class nature. In other words, it requires that any occurrence, any event be evaluated from a class position, that the imperialists' intrigues be recognized and halted, that their criminal intentions be frustrated.

The Soviet people are proud of their homeland, which has lived through the equivalent of centuries in 60 years. They are proud of their way of life and reject the bourgeoisie's way of life with its cult of profit and cruelty. Our people are ideologically steadfast and certain. They easily identify the intrigues of the ideological enemies and expose their hypocritical propaganda. Soviet patriots are always on the alert, always prepared to defend the homeland. The Great Patriotic War, which also brought out mass heroism, convincingly demonstrated this.

#### Effects of Socialist Competition

Moscow VOYENNNYYE ZNANIYA in Russian No 6, Jun 77 signed to press 12 May 77  
pp 8-9

[Letters to the Editor: "The Main Guarantee"]

[Text] For good training effectiveness and quality!" -- socialist competition with this slogan has been initiated in the civil defense system. Our readers tell about this, the main guarantee of success.

#### A High Level of Effectiveness

I recently attended a comprehensive, unit-wide civil defense exercise of the Karakumgidrostroy Trust. It was instructive. The collectives of mobile mechanized columns (PMK) demonstrated good training and coordination.

Just what contributed to this success?

"Socialist competition!" answered chief of staff Orazmurad Charyyev.

The trust leaders, party, Komsomol and trade-union organizations and the civil defense staff show constant concern for competition effectiveness. I would also point out that they conduct competitive reviews; competitions for the best fulfillment of techniques, actions and norms during the course of training; quizzes; and athletic competitions for meeting the GTO ["ready for work and defense"] set of norms (the "Civil Defense" sections).

This year the competitive review is devoted to the 60th anniversary of the Great October Socialist Revolution. Competition conditions and increased commitments to further improve civil defense were accepted at a general meeting of the trust collective. Six prizes have been provided for the winners. All of the workers and employees in the subunits (podrazdeleniya), the commanders and fighters of paramilitary formations have accepted individual commitments and are successfully fulfilling them.

Take PMK-30, for example. A civil defense training center had been set up there in one of the defense installations. Upon entering it one is immediately convinced that it contains everything necessary for productive, practical training: good displays, special training equipment, training areas, visual aids and literature, including literature in the Turkmen language. A separate display depicts the course of the competition and gives the names of those excelling in training. There on a small table is also a book of honor. The names of the best civil defense activists are entered in it.

An attractively framed Certificate of Merit hangs on the wall. It was awarded to the mobile mechanized column's collective by the commander of the Red Banner Turkistan Military District for exemplary fulfillment of civil defense tasks. K. Il'begiyav, chief of the civil defense column, A. Kausov, secretary of the party organization, and the staff headed by Communist G. Gumennikov did in fact work a great deal to achieve a worthy place among the competing formations.

Let us at least take a look at how skills in building simple protective installations are acquired there. In addition to nonstandard construction parts reeds and clay were used as building materials for the first time. It was no surprise that the experience of those progressive individuals rapidly spread not only to trust facilities but to nearby rural rayons as well. In addition to their main purpose the facilities have also made good storage facilities for vegetables and fruits.

The situation in PMK-31 and other formations is the same. Theoretical and practical skills in defense against modern weapons are helping the trust collective and its paramilitary formations to actively combat the elements, which are strongly felt in Turkmenia. They had to enter into a serious struggle against high water during the spring of last year, for example. The river Tedzhen went out of its banks following torrential rains. The territory of Tedzhenskiy and Kirovskiy rayons was in danger of flooding. The trust's paramilitary formations under the supervision of civil defense chief A. Charyyev were alerted. They carried out a march, immediately setting about the job.

The selfless duel with high water continued for 15 days. And the elements withdrew. Among those who distinguished themselves especially were Z. Yumagulov, chief of PMK-31, Ye. Svinarev, leader of a dredging brigade, and bulldozer operator I. Annakurbanov.

"Competition was also the main motivating force in this instance, and all of the personnel demonstrated a high level of awareness and courage," commented chief of staff Charyyev. "Each individual attempted to apply the knowledge and skills obtained in training sessions and exercises to the best of his ability..."

And now, a few words about the chief of staff himself. He formerly served on the front and was singled out for many combat awards. Following the war he completed the Higher Party School in Ashkhabad, worked in the Mary Party Gorkom and was then sent to help build the Kara-Kum Canal. In 1966 the communists recommended him for the position of civil defense chief of staff for the trust. For more than ten years now he has successfully worked at this responsible post.

Everywhere we went people always spoke of Charyyev with great warmth:

"He is a good organizer, knows the job and helps us a great deal..."

Orazmurad Charyyev is also deputy secretary of the trust party bureau and is very active in the military and patriotic indoctrination of the youth.

"This is my special individual socialist commitment," he says. -- M. Kolganov, Mary, Turkmen SSR

#### The Best in the Branch

During the last training year our plant was named best unit in the branch in civil defense. In the year in which we are celebrating the 60th anniversary of the Great October Socialist Revolution, having taken up shock watch, we are attempting not only to strengthen that which has been achieved but to increase it as well.

In the socialist competition which has developed among shops and sections we have set out on a firm course towards effectiveness and quality in practical training. The necessary training materials base has been created for this purpose at the facility: a training center, a realistic training area, civil defense nooks and visual aids in the shops and sections themselves. Training group leaders and commanders of paramilitary formations have received good training in methods. Classes are conducted regularly, strictly according to schedule and without breakdowns.

Under the supervision of the party committee shop party organizations have initiated purposeful party-political work in their collectives and formations. It is aimed at insuring that all of the workers and employees and the fighters and commanders of formations master the training program well and meet the specified norms with an excellent or good rating.

We receive a great deal of assistance from the staff at our facility, which for 17 years now has been headed by front-line soldier, Major (Reserve) I. Rudov. We chiefs of civil defense staff value highly the knowledge and organizational abilities of Ivan Andreyevich and his ability to work with people. And he deserves a great deal of credit for the fact that the plant is successfully accomplishing its civil defense tasks. -- S. Savenkov, foreman, chief of civil defense staff for Shop No. 2 of the Kolomyia Agricultural Machinery Plant, Ivano-Frankovskaya Oblast

The Banner Remained in the Rayon:

Leninskiy Rayon in the city of Donetsk is rich in glorious revolutionary, combat and labor traditions. Mostly metallurgists, machine builders and construction workers live there. For its production successes achieved in the first quarter of this year the rayon was awarded first place in the socialist competition in honor of the 60th anniversary of the Great October Socialist Revolution.

Defense tasks are also being successfully accomplished. Rayon chief of staff Ye. Turanskiy told us about how the enterprise collectives and personnel of the paramilitary formations, taking up watch for the anniversary of the Great October Socialist Revolution, are struggling for quality in the training and effectiveness in civil defense undertakings.

"For the third year in a row our rayon has been awarded first place in socialist competition in civil defense. The Challenge Red Banner of the party gorkom and the gorispolkom stayed with us this year as well..."

A large group of activists were awarded "USSR Civil Defense Expert" badges. These include D. Shatalov, first secretary of the raykom of the Ukrainian Communist Party, and M. Mironova, chairman of the rayispolkom and rayon civil defense chief. It should be mentioned that they skillfully supervise civil defense and constantly help the staff and schools to conduct efficient organizational work and improve training quality.

"We have received a great deal of assistance in particular," continued Comrade Turanskiy, "with the job of creating and renewing the training materials base at the different units. This matter has been discussed in the party raykom and rayispolkom. The equipment of good training areas and centers was included in the commitments. Almost all of the units now have them. The best ones, however, are at the Metallurgical Plant imeni V.I. Lenin and at the refrigerator plant. Many others are taking an example from these progressive units..."

That point in the commitments on improving training quality for the commanders and chiefs in civil defense courses and at the production units themselves is being successfully fulfilled. Classes in the first training groups (for enterprise supervisory workers and chief specialists) are usually conducted by the unit civil defense chiefs personally. They receive methodological assistance from the instructors and production training experts in the courses.



Planned, comprehensive all-unit exercises are being conducted at many units in the rayon this year. The unit chiefs of staff with the support of party, Komsomol and trade-union organizations are striving to see that the training programs are mastered in all of the labor collectives and paramilitary formations. And this is one of the main commitments in the socialist competition.

"I believe that our comprehensive, unit-wide exercises will be conducted on a better methodological level this year," concluded the chief of staff.

Yevgeniy Iosifovich said nothing about his own work. His creative work is there for everyone to see, however. Deputy to the rayon council, Communist Turanskiy performs his service duties in a creative manner. It is not surprising that he was awarded the "USSR Civil Defense Expert" for his successes in the competition. -- Colonel (Retired) N. Beloshov, Donetsk

#### Summer Season Practical Training

Moscow VOYENNIYE ZNANIYA in Russian No 6, Jun 77 signed to press 12 May 77 p 17

[Article: "The Crucial Training Period"]

[Text] This year, the 60th anniversary of the Great October Socialist Revolution, has brought a special, creative atmosphere to the lives and work of the Soviet people. They are greeting the important anniversary with gifts of labor in all spheres of production work.

Civil defense staffs, services and paramilitary formations are standing shock watch in their collectives. As they accomplish their tasks together with their production jobs they attempt to reinforce the knowledge and skills obtained during winter and spring training, during the course of special tactical exercises and various competitions. Summer can be considered the crucial period for improving practical training. And it should be productively utilized for further training in techniques and methods of protection against modern weapons, skillful and competent actions for mopping up after natural disasters.

In the summer the specific nature of the production work of national economic units affects civil defense training considerably. While the work of industrial enterprises is not so seasonal the height of the field work on kolkhozes and sovkhozes is accompanied by certain difficulties with respect to conducting civil defense measures. This is why it is preferred that exercises in the rural areas, including comprehensive, unit-wide exercises, be conducted earlier. It is not possible in the winter and early spring, however, to work out all of the civil defense tasks typical for agricultural units. For example, such problems as plant protection, fire prevention, protection against radioactive contamination of the field workers, decontamination of the equipment in the field and many others do not receive attention.

A comprehensive, unit-wide exercise conducted during the summer would thus give the rural workers considerably more skills in protection against modern weapons and for combatting the elements. This is borne out in particular by the experience of the Svobodnaya Zhizn' Kolkhoz (Kimovskiy Rayon, Tul'skaya Oblast). Workers on that farm demonstrated the usefulness and the acute need to coordinate training tasks with the performance of farm jobs (weeding, combatting agricultural pests, the procurement of feed, the setting up of threshing floors and field camps, and so forth).

Practical training methods worked out on the Rodina Kolkhoz (Mar'inskiy Rayon, Donetskaya Oblast) for paramilitary formations in the summer are worthy of attention. This is what civil defense chief of staff I. Litvinenko writes:

"Harvest time was approaching. Storage facilities had to be prepared and decontaminated to receive the grain. It was decided to accomplish this in a practical exercise for personnel of the plant protection squad. V. Grintsov, commander of that formation, assigned the task of sealing the storage facilities to the team of I. Panchekha. The fighters followed all the rules for sealing off windows and doors and made provisions to cover the ventilation ducts in case of radioactive fallout. The building itself was specially treated with a Formalin solution using an OVS-2 sprayer. Team members worked in gas masks and respirators. All of the storage facilities were thus readied for storing the grain and feed, and the formation acquired useful skills."

Vacuum barrels and pumps are provided for washing down combines in the field. In the process machine operators on the above mentioned Rodina Kolkhoz are taught methods of decontaminating agricultural machinery of radioactive dust using practical classes.

Experience has shown that practical civil defense classes can be tied in with farm work. This training needs only to be properly planned and a tactical situation skillfully created in order to conduct all of the classes efficiently and on a good methodological level.

Civil defense day has become a tradition in many oblasts and cities. They are frequently preceded by comprehensive unit-wide exercises. They constitute a sort of summary of the winter and spring training: various competitions in fulfilling the norms and in skillful and competent actions by paramilitary formations are organized at units, in the rayons and cities; and a group of civil defense propaganda measures are conducted. Komsomol and trade-union organizations, DOSAAF, Red Cross and Red Crescent committees, active members of the Znaniye society, military commissariats and workers at cultural institutions, under the supervision of party and soviet organs, take an active part in preparing for and conducting civil defense days. The greatest efficiency and effectiveness is thus achieved in military and patriotic indoctrination and in the publicizing of civil defense.

The school children have begun leaving for Pioneer camps in large numbers. Their supervisors and Pioneer guides have a good opportunity to strengthen in the children the practical civil defense skills obtained during the last school year, especially during the "Zarnitsa" military sports games.

We can see that summer is a busy time for civil defense staffs and schools. We must demonstrate the maximum degree of organization and creative initiative in order to improve civil defense at all levels during this crucial practical training period.

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